SSD

"BOOKMAN SERIES"

生態學文献抄錄帖

一

KYOTO IMPERIAL UNIVERSITY

SPECIAL NOTEBOOK

Abstracts from Ecological Literatures

Vol. 1

1935-1939

"BOOKMAN SERIES" SANSEIDO CO. LTD.

スギ, ブナ.
ヒノキ, ダケモミ } 然 河田 p.384 =「すぎもひのきも共ニ

或程度以上ノ高地ニモ又或程度以上ノ低地ニモ生活シ得ナイコトハ疑ヘナイ事実デアリマス」

ト断ジテオルガ、ソノ分布範囲ハスギトヒノキデ水平分布的areaガ全一デナイ. 然 スギハブナニ, ヒノキハダケモミニ或範囲デアテハマツテオル.

p.386

「主ナルすぎ林ハ一月ノ降水量150mm ~~線~~以上ノ所ニ現レテオル

之ヲ~~以~~以テすぎノ分布ヲ支配スル一條件トシテ冬季ニ或程度以上降水量ガ多クナケレバナラヌトイフ事ヲ推スルコトハ出来ルト思ヒマス」

「ひのきハ七月ノ降水量150—200mm ノ等降水量線以上ノ所ニ分布シ、且七月ノ等温線23度附近以上ノ所ニ限ラレテオル」

然シ秋田地方デ150mm以上ノ降水量ガアルニひのきガ出現シナイコトヲ説明スルニハ未知ノ條件ガ存在スルデアロウト考ヘテオル! (全然)

河田氏ノ工夫ハ要スルニすぎニ対シテ冬季, ひのきニ対シテ夏季ヲ基本stationトシ, 之ニ対シ全国ノstationノ同季ニ於ケル降水量分布ノ相関係数ヲ求メタ.

ソノ結論トシテ

p.390 =「すぎノ分布ノ現状ハ冬季ニ於ケル降水量ノ多少ト

四季ヲ通ズル降水量ノ配布状態ト すぎが最モ生理的ニ優勢ヲ占ムル地方ノソレトノ間ニ存スル相関係数ノ数値トノ二者ノ綜合的結果ノ支配ヲ受ケテヰルモノト解釈デキル

ひのきノ分布ノ現状ハ夏期ニ於ケル降水量ノ多少ト四季ヲ通ズル降水量ノ配布状態ト ひのきが最モ生理的ニ優勢ヲ占ムル地方ノソレトノ間ニ存スル相関係数ノ数値トノ二者ノ綜合的結果ノ支配ヲ受ケテヰルモノト解釈出来ル」

ノ結論ヲ、コノ相関係数トイフノハ すぎニ対シテ 0.0，ひのきニ対シテ 0.5 デアル。

尚天然生すぎが一月等雨量分配図ノ100mm以上ノ地域内又ハ其ノ附近ニアッテ少ナカラザル地方ニハ苅木（カリギ）トナッテ存在シテヰルト云フコト、

既ニ1929ニ寺崎氏ノ述ベシ所デアル
↓
p.463.

津田氏 Nov. 2, 1931
竹生島西岸ノ波打ギワニテ Ecdyonurus yoshidae ヲ採集セリ。

帝林，主山ニハ
vol.15 p.5 =
Coniferae ナル Nadelhölzer-Region ノ
「Cryptomeria japonica, Abies firma, A. mariesi, A. veitchii, Larix leptolepis ノ主林ヲアグ。

Inokuma　1934 b
p.152.
~~モミ林ハ金華山島及ビ半島ノ~~
「海岸ノ松林ハ黒松ヨリ成ル所ハ却ッテ少ナク，
海岸ヨリ直チニ赤松林ヲ成ス所ガ多イ．次ニ
モミ林ハ金華山島及ビ半島ノ南部殊ニ谷
ニ多ク，本邦モミ林ノ北限ニ稍近ク高ク良材
ヲ産出スル．」

常緑闊葉樹ノ種類ニ　p.154
「ヤドリギ，シキミ
イヌツゲ　モチノキ　タブノキ　トベラ
ヒサカキ　キヅタ　マサキ　ヤブツバキ
テイカカヅラ　スセカヅラ　アオキ　ヤブコウジ」
ヲアグ

p.160
「ブナ．金華山島，荻ノ浜，新山浜—泊浜間山脊」
トス

p.164　タブノキ
「金華山島西南部ニテ稀ニ散布スル．網地島，
田代島，土番所，鮎川，鮎川浜崎，江島，新山浜」

猪熊泰三　秩父演習林及其附近ノ木本植物（予報）追録 I
p.195，1934．
東京帝国大学農学部演習林報告第二十号
アラカシ
「大血川中流其他三峯山ヲ廻リ海抜500—
600mマデ野生ス」

……ハ四分

四、九州植物地理概論

p.441 「カクテ カシ類、クスノキ科諸種……ノ如キハ台湾、沖縄由来ノ要素ト同一視セラルル場合モアッテ」

固有日本北部由来の要素

p.442 「タウヒ、シラビソ、ウラジロモミ、バラモミ、コメツガ、クロベ、イチイ、シラカンバ、ダケカンバ……等ヲ有スル近畿南部ノ山地ハ其ノシラビソ、ウラジロモミ、バラモミ、コメツガ、クロベ、イチイ、ダケカンバ……等ヲ四国ノ山地ニ失ヘ、ヤガテ九州南部ノ山地ニバラモミ、イチイ……等ヲ失フ(以下略)」

然シ「固有日本北部由来」ナル語ノ説明モ ソノ criteria モ挙ゲテイナイ。

仝 「ヒメコマツ……カツラ、ネムノキ、ケヤキ、ブナノキ、ミズナラ、クリ……ノ如キハ比較的西九州ニ至ルマデ通常之ヲ見ル」

固有日本南部由来の要素

p.445 「(植物名ニ×印ヲツケタルハ支那由来ノ植物ナリ)
×カシ類……ノ如ク関東北陸或ハ東北ニ及ブモノアリ」

p.445—446 「又九州ニ始マリ比較的東海乃至関東地方ニ及ブモノニハ分布上注意スベキ插例アリ…カウヤマキ……ノ如キ是ナリ」

p.446 「屋久島若クハ種子島ニ見ラル植物ノ種類ニテ上述ノ外ニ固有日本南部ノ要素ト認ムベキモノヲ挙グレバ左ノ如シ
モミ、ツガ、スギ、ヒノキ、クロマツ、カヤ、イヌガヤ、クヌギ……
×アカガシ、アラカシ、ウラジロガシ、ウバメガシ、……
……其要素ハイズレモ分布ノ南限ヲナスモノニテ其中ニハ前ニ挙ゲタル外帯植物ニヨリテ之ヨリ北進スルモノアルヲ思ヘバ此事実ヨリモ、両島植物ハ九州植物区系ノ一部ニシテ、之ニ固有日本植物区系ノ境界線ヲ画クベキヲ知ルニ足ラン」

台湾沖縄由来の要素

p.448 「……シイノキ類分布北限地帯ハ関東地方及能越地方ナリ……タブノキノ分布北限地帯ハ羽後陸中ニ及ビ(加藤博士踏査)……ヤブツバキノ分布北限地帯ハ本州ノ北端ナリトス」

p.451 「台湾沖縄由来ノ植物要素ハ海流ノ影響ニヨリテ沿海伝ヒニ北進スルモノニシテ分布ノ別形式ナリ……又此要素ノ分布ハ固有日本南部要素ノソレニ伴フモノ多シ」

p.453 「実ニ固有日本植物で系ガ屋久島及種子島ニ至ルコトハ、山地ノ植物ニ就テモ丘陵地及平地ノ植物ニ就テモ之ヲ認ムルヲ得ベシ。固有日本北部由来ノ諸属種及固有日本南部ノ植物及九州ニ就ケル固有植物ハ、殆ンドコレニ止マリテ、奄美大島以南ニ及バズ。奄美大島ノ台湾沖縄由来ノ諸属種ヲ含ムコト多キトハ頗ル相異ナルモノアルナリ」

コレガ小泉博士等ノ唱道スル吐噶喇海峡ノ植物地理学的意味デアルノダ！

Beiträg 29 〃 1931.
65 〃 1935

永田；大雪山ノ森林植物帯論

p.642 「山麓帯 300－400
　山地帯 400－1200
　　1. 針闊混淆林帯 400－600
　　2. 針葉樹帯 600－1100
　　3. えぞのだけかんば区 1100－1200
　高山帯 1200以上
　　1. 灌木帯 1200－1500
　　2. 高山植物帯 1500以上.」

p.644 山麓帯

「此ノ樹種ヲ見ルニ、本州ヲ除テ九州四国ニ見ル本多博士ノ所謂温帯林ニ主ト(シテ)分布スルモノ及温帯林ノ要素ト認ムベキモノハ イヌガヤ、トドマツ、………
カツラハ大体600米ヲ限界トセリ。」

p.644－645 「温帯的分子ニシテ高地ノ寒帯ノ一部ニモ侵入スル両帯ノ共通種ト認ムベキ樹木ハ次ノ如シ… ミズナラ…
カシワ…シナノキ、…；イチイ
即チ大体ハ温帯林ニ属シテ之ヲ生ズルモノナリ。原始附近ニ連亘セル丘陵、山背ノ如キハ、トドマツヲ主木トセル寒帯林ナルコト多キナリ。因是観レバ、石狩、空知、十勝等ノ諸川ノ流域ハ温帯的樹種ノ潤生ニヨリテ専有セラルルコトヲ知ルナリ。」

p.645 「上述ノ如ク本帯ハ特ニ温帯的並ニ寒帯的両分子ノ混合ニヨリ極メテ錯雑セル状態ニアリ」

Ⅱ 山岳帯

p.646 「いちいノ如キモ ~~[illegible]~~ 七百米突以上ノ地点ニ引キ去ラル。

Ⅱa 針闊混淆林帯

p.647 「要スルニ本帯ハ樺太ノ温帯的落葉樹ヨリナリ、之レニ少数ノとどまつ、えぞまつ等ノ寒帯林ノ分子ヲ混生セル針闊混淆林帯ナリ。」

Ⅱb 針葉樹帯

p.648 「主ニ針葉喬木ヨリ、アオトド、アカトド、アカエゾ、エゾマツ等ヨリ成ル、.... 本帯ニハ針葉樹ノ外ニ、イチイノ少数ト高山帯ニハ、ハイマツヲ加フ」

Ⅱc えぞのだけかんば区

p.649 「本帯ニハ前記樺科ノ諸種ノ外ニ、アカエゾ、エゾ等ヲ僅ニ混ズ....
」

早田 1905 台湾植物誌

p.45 「P. Karaiensis Hab. Morrison
Distrib. Central, North-East China, Corea, Mandschuria, and Japan.

P. parviflora Hab. Shōhakurin; Hokkōkei, Holisha.

Picea glehni. Hab. Morrison.
Distrib. Northern part of Japan, Hokkaidō, and Saghalin.

Tsuga diversifolia Hab. Morrison.
Distrib. Mountainous regions of Japan.

T. japonica Hab. Morrison.
Distrib. Middle part of Japan.
Note:— This genus is only found in North America, Japan and Formosa

Abies mariesii. Hab. Morrison.
Distrib. Northern part of Japan.」

p.46 「Cryptomeria japonica Morrison
Distrib. China, Central, South and North; and Japan

p.59. Summaryニテ Chino-Japanese floraヲ二ツニワケ
Borter Florule ト Central Florule ニ分ツ
モトニ North China ニ originate スル。
而シテ台湾ト日本ノ Conifer ノ相似ハコレラトモニ
Borter Border Florule ヲ形成スルコトニアリ

中泉：御嶽 1914

p.17 「御嶽ノ森林帯ハ上方(1700-2450)ニハ針葉樹林アリ
下方(700-1700)ニハ落葉濶葉樹林アリ、濶葉樹
ガ1700米突以上ニ森林ヲ形成シ難キハ又気候及ビ
之ヨリ結果セシ土質ノ関係ニ基因ス」

p.18 「針葉樹林亦決シテ1700米突以下ノ帯ニ適セザルニ
非ラザレドモ濶葉樹ノ生育シ得ル帯ニテハ天然ニ之ト
競争スルコト難シ、而[illegible]リノ競争ノ状態ニ就テハ
此後ナヲ考究スルノ余地十分アラン。サレバ下方ニ生ゼン
ヨリハ上帯ノ濶葉樹ノ生育シ難キ地ニ森林ヲナセバ
針葉樹元来ノ性質ハ乾性的植物ナルヲ以テ此上帯ニ
生育スルコト決シテ難キニ非ラズ。」

p.18–p.21.
「今御岳ニ於ケル山地植物帯及ビ主要ナル植物群落
ヲ表示スレバ大略次ノ如シ。
A 高地ノ植物群落
1 地衣帯 (Subnival Belt)
略。

2 高山草本帯 (Alpine Belt)
略。

3. 高山灌木帯 (Subalpine Belt)

a. 高山灌木林 (Subalpine ~~Sub~~ Shrub formation)
ソノ中ニハイマツ群落ヲ設ク

b. 高山矮小灌木群落 (Subalpine dwarf scrub formati
略

c. 高山灌木帯ノ草地 (Subalpine Mat formation)
略

p.20, B. 山腹並ニ山麓ノ植物群落

4. 上方針葉樹帯 (Conifer Belt)

a. 針葉樹林 (Coniferous forest formation)
1. つが單純林 (Tsuga association)
2. しらべ、とうひ混交林 (Abies-Picea association)
3. しらべ單純林 (Abies association)
4. しらべ、とうひ、ななかまど混交林 (Abies-Picea-Sorbus assoc.
5. しらべ、とうひ、だけかんば混交林 (Abies-Picea-Betula assoc.
附 だけかんば單純林 (Betuletum ~~o~~ Ermanii)
~~中略~~ 他略

21, 5. 下方落葉闊葉樹帯
(Deciduous broad leaved forest Belt)

前略

f. 落葉闊葉樹林 (Deciduous forest formation)
1. しで、かへで類ノ主林木林 (Carpinus-Acer association)
2. なら類ノ主林木林 (Quercus association)
附 さはら群落 (Chamaecyparidetum pisiferae)
赤松林 (Pinetum densiflorae)
他略

p.49 「木曽御嶽山ノ落葉闊葉樹林ハ海拔900米突ヨリ1700米突ノ高サニ達ス。先ニ云ヒシ如ク御嶽ノ位置ハ餘程暖帯ノ範囲ニ近キヲ以テ往々山腹以下ニ暖帯ノ分子ヲ含有ス。サレバ此分子ノ存在ニヨリ山麓帯ヲ区別シ得。

山麓帯—900米突内外ノ高度ニ達シ次ノ要素ヲ有ス.

さいかち	Gleditschia horrida.
ざいふりぼく	Amelanchier asiatica
そよご	Ilex pedunculosa.
だんこうばい	Lindera obtusiloba.

」

p.50 「闊葉樹林ノ主林木ハ次ニ示スガ如ク なら類及ビかへで、しで類ニシテ 木曽五木ノ一ナル ひのきハ峰通ニ、さはらハ渓間ニ小群叢ヲナシ あかまつ亦処々ニ群落ヲ形成セリ。

みづなら	Quercus	crispula
こなら	Q.	glandulifera
くり	Q.	sativa
いぬしで	Carpinus	yedoensis
あかしで	C.	laxiflora
さはしば	C.	cordata
くましで	C.	Distegocarpus
やまもみぢ	Acer	palmatum
いたやかへで	A.	pictum
はうちはかへで	A.	japonicum
こはうちはかへで	A.	sieboldianum

55 「針葉樹帯ハ山腹1700米突ニ始リ2600米突ニ終ル…
(中略)
宏大ナル森林ニシテ下半ハ こめつがノ純林ニシテ 僅カニしらべヲ混ズレドモ 上半ハしらべ、たうひノ混交林ナリ。下方ノこめつが林ノ中ニ之ト粗ニ混交スル林木ハ左ノ諸種ニシテ

てふせんまつ	Pinus koraiensis
おにもみぢ	
なゝかまど	
うはみづざくら	
せんのき	
こばのとねりこ	
p.56 くろべ	Tsuja japonica

(中略)
しらべ―とうひ林中之ト疎ニ混交スル闊葉樹ノ主ナルモノハねこしで、だけかんば及びなゝかまどノ三種ナリ」

p.57 「針葉樹帯ノ最上部即チ樹木ノ限界ニハ だけかんばノ純林アッテ細長帯ヲナセリ。此 だけかんば林ハ漸次針葉樹林ヲ以テ置換セラルベキモノニシテ 只昔時ノ廣大ナル第一次林相ノ面影ヲ残スノミナリ。樹木ノ限界ハ大陸的気候ノ例ニ於テ最高処ニ達スルモノナルガ御嶽ニテハ各側ニ大差ナキヲ以テ大体2450米突位ニ止レリ。」

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	1126	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	215	<5199
[illegible]	2009	[illegible]	145	1456	<801
[illegible]	[illegible]	[illegible]	[illegible]	571	<303

d > a > b > c
a > d > b > c
a > d > c > b
a > d > c > b
a > d > c > b

May 2. 1931, 1934, 1935

p. [illegible]

[illegible]

[illegible]

p. [illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	2. 25

[illegible]

[illegible]

[illegible] coefficient of [illegible]

[illegible]

西田, 夕張岳

p.79 [illegible]

「[illegible] 300m–400m ニ於テハ、[illegible] 針葉樹 [illegible]。[illegible] 320m [illegible] トドマツ、エゾマツ [illegible] 針 [illegible]。」

[illegible]

「[illegible] 針葉樹 [illegible] 亜高山帯 [illegible] トドマツ、エゾマツ [illegible] 針葉樹木帯（亜高山帯 p.112）」

p.81

「[illegible] エゾノ [illegible]。」

p.82

亜高山帯 Subalpine-region [illegible]
針葉樹帯 Coniferous-region [illegible]
ハ Synonym [illegible]

p.84 「[illegible] 300m–400m [illegible] 山頂 1200m [illegible] 針葉樹木 [illegible]。トドマツ、エゾマツ [illegible]。トドマツ、エゾマツ混交 [illegible]」

p.51
「えぞのだけかんば[illegible] Betula ermani formation. 本帯ハ[illegible]
[illegible]高度1200−1600mニ[illegible]山岳[illegible]ニ位シ[illegible]えぞのだけかんば[illegible]
ノ這松及ビ小灌木ト混在[illegible]. 其[illegible]
ヲ形成[illegible]」

p.85 「高山帯 Alpine region 本山脈ニ於テハ高地1400m
以上ノ[illegible]はじまる[illegible]えぞのだけかんば
林[illegible]高山灌木帯[illegible]」
但 えぞのだけかんばヲ高山帯ニ入レタリ

草本帯ヲ除ス p.81-82

p.80 「[illegible] 本山脈ニ於テ高地[illegible]草本帯トナスハ、----
要スルニ針葉喬木ノ[illegible]125[illegible]ナリ。」
∴ えぞのだけかんばヲ高山帯ニ入レルナリ

p.80 はいまつノ下限 1200—1400 [illegible]

p.1[illegible]

Miyabe The Flora of the Kurile Islands, 1890, p.[illegible]
'From these observations, I agree with Professor [illegible] in the opinion that at the time of the last great southerly migration of the arctic polar flora, Japan received her portion mostly through the island of Saghalin, and but little, if any, through the now uncompleted chain of the Kurile Islands'.

[illegible] 武田氏ハ
[illegible] 武田氏ノ[illegible] The Flora of the Island of Shikotan (1914) [illegible]
[illegible]

「武田氏ハ Blakiston line ト植物分布ニツイテハ //
[illegible]」

p.172 「[illegible]
[illegible]」

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

(1) [illegible]

[illegible]

(2) [illegible]

[illegible]

(3) [illegible]

[illegible]

(1) [illegible]

(2) [illegible]

p.299

[illegible]

「[illegible]

[illegible]

[illegible]

[illegible]」

中井　アポイ山　810m

p.16「山[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

p.24　中[illegible]

「[illegible]

[illegible]

p.25　アオトド, [illegible]」

p.31「[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]*

[illegible]」

* Betula maximowicziana

[illegible] [illegible]

[illegible]

[illegible] [illegible]
[illegible]
[illegible]
[illegible]
[illegible] [illegible]
[illegible]
[illegible]。」

[illegible]

[illegible]
[illegible] 「[illegible]……」

[illegible] W. Berry: [illegible] and [illegible] land connection
geographical distribution. [illegible]
1. [illegible]
2. [illegible]
[illegible]
[illegible]
3. [illegible] continents
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]
[illegible]

[illegible] Distribution [illegible]

[illegible]

[illegible] [illegible]

[illegible] [illegible] ~~[illegible]~~ [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Kawada, General nature of Japanese forests, [illegible]

[illegible] of forest vegetation [illegible]

From the standpoint of [illegible] the forest [illegible] of [illegible] forests may be classified into the following six types.

A. Northern [illegible] coniferous forest

[illegible] dominant: Abies sachalinensis, Picea jezoensis

B. High mountain subalpine coniferous forest

[illegible] dominant: Abies mariesii, A. veitchii
Picea jezoensis var. hondoensis
Larix leptolepis, Pinus koraiensis
Tsuga diversifolia

C. [illegible] forest mixed [illegible] and [illegible] broad-leaved trees

In the [illegible] it is [illegible] associated with Tsuga sieboldii

[illegible] dominant: Cryptomeria japonica
Chamaecyparis obtusa
Fagus crenata

D. [illegible] forest mixed with conifers and evergreen broad-leaved trees

The [illegible] of this forest is very [illegible] owing to the association of the evergreen broad-leaved trees and the [illegible] of Tsuga sieboldii, which is very rare in [illegible] mixed forests and deciduous broad-leaved trees

[illegible] dominant: Abies firma, Tsuga sieboldii
Picea polita, [illegible]
Pinus densiflora

E. Temperate rain forest of broad-leaved evergreens of the [illegible]

[illegible] dominant: Podocarpus macrophyllus, [illegible]
Shiia sieboldii, Machilus thunbergii 77
Quercus glauca, Q. [illegible]
Distylium racemosum 12
[illegible] racemosa

F. Strand pine forest.

[illegible] 12, '3[illegible]

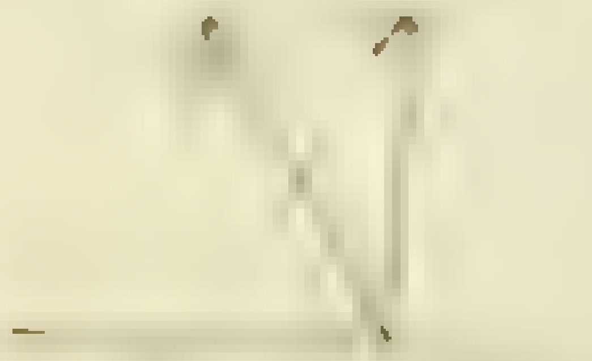
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

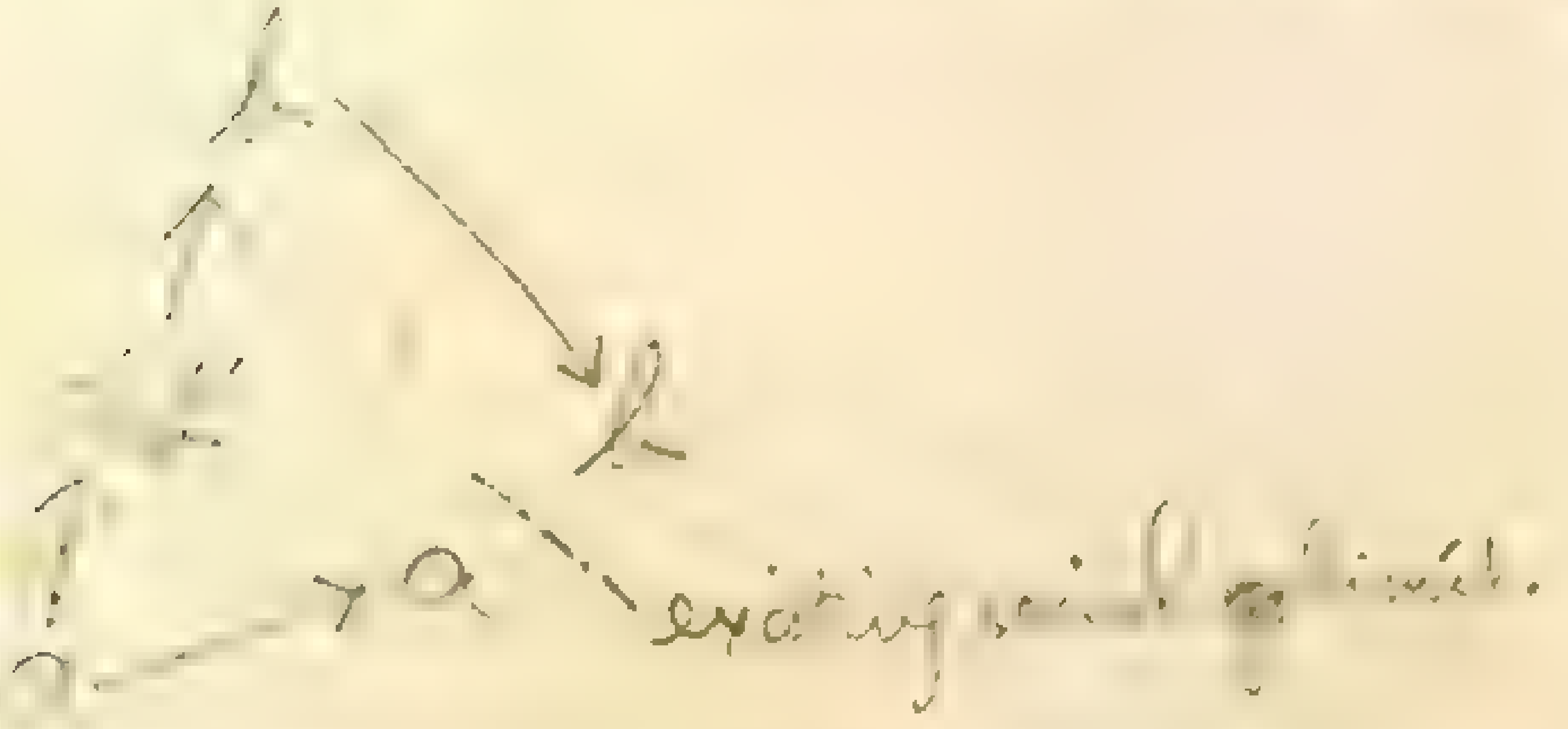
[illegible]

[illegible] social [illegible]

[illegible] (2)

[illegible]

[illegible]



F. D. Klyver (1931) 'Plant communities of the Sierra Nevada' ニヨル
Ecology, vol. 12, 1931

* characteristic or dominant

~~Pinus albicaulis~~

Alpine communities

Subalpine Forest

Pinus albicaulis .... Hudsonian zone
P. monticola .... Canadian–Hudsonian
Tsuga mertensiana .... Hudsonian zone

Fir-Tamarack Forest

* Abies concolor (white fir) lower elevation .... Transition zone
* A. magnifica (red fir) higher elevation .... Canadian zone
* Pinus contorta (lodgepole pine) "
P. lambertiana .... Canadian–Transition

Western Yellow Pine Forest

* Pinus ponderosa (yellow pine)* .... Transition Zone
Libocedrus decurrens (incense cedar)* .... Transition Zone
P. lambertiana (sugar pine) ranging higher than P. ponderosa, Transition Zone
Pseudotsuga taxifolia (Douglas fir) .... Transition Zone
Quercus kellogii (black oak)* .... Transition Zone

Chapparral

Q. douglasii ....
P. sabiniana .... Upper Sonoran Zone
Q. wislizenii .... Upper Sonoran Zone
Q. chrysolepis .... Upper Sonoran Zone
?

Foothill Woodland

* Quercus douglasii (blue oak) .... Upper Sonoran Zone
Pinus sabiniana (digger pine) .... Upper Sonoran Zone
Aesculus californica .... Upper Sonoran Zone
Quercus wislizenii .... Upper Sonoran Zone

Great Valley Grassland

Quercus lobata (valley oak) .... } Lower [illegible] Zone (after Grinnell, '24 'Animal Life')

Subalpine Forest
.... Pinus albicaulis

Lodgepole Forest
.... Pinus contorta

Jeffrey Pine Woodland
.... Pinus ponderosa var.

Sagebrush
.... P. ~~[illegible]~~ ponderosa, forming an open woodland.

Grinnell, Transit.
= 2. Sierra.
Klyver, Transit.
zone defines not.
(Klyver '31 p.1)

** = Hall & Grinnell (1919) 'Life-Zone Indicators in California' ニヨル
各 species ノ所属ノ zone ヲ示ス.
* = characteristic species of the zone.

Feb 6, '37.

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]
[illegible]

[illegible]
[illegible]
[illegible]

[illegible]
[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

p.108. hiner Gürtel = [illegible] Schluss[illegible]verein + [illegible] Gürtel = [illegible]
[illegible] Nardetum + Rhodoretum + Piceetum [illegible]
Rhodoretum + Piceetum + [illegible] Montane stufe [illegible]

[illegible]

[illegible]

[illegible] eich die [illegible] [illegible] [illegible] [illegible] [illegible] dass die [illegible] [illegible]

[illegible] Rhodoretum [illegible]

A.S.

[illegible] A common system of [illegible] in plant and animal [illegible], Ecology. 4: 3[illegible] – 3[illegible].

[illegible]
Hult, 1887
[illegible] [illegible], 1897
[illegible] 1887
[illegible]
[illegible]
[illegible] 1885
[illegible]
[illegible] 1883
Ostenfeld 1888
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]
[illegible] 19[illegible]
[illegible]
[illegible] 191[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

Morse, 1904 Researches on North American Acridiidae
Carn. Inst. Wash., Pub. 18.

Klugh, 1923 [illegible] succession [illegible]

Is such a vast habitat as the ocean to be regarded merely as a subsidiary seral unit of some hypothetical climax? [illegible]

(p. 367)

[illegible] succession [illegible]

[illegible]

[illegible] 1874, Allen 1899, Lo B[illegible],
Judd 1902, Morse 1904, Wheeler 1905,
[illegible] 1909, Hancock 1905, S[illegible] 1910,
Gates 1911, Hancock 1911, Walker 1913,
Vestal 1913, Reichard 1913, Pearse 1913,
Wood 1914, Baker 1914, Walker 1915,
[illegible] 1916, Ellis 1917, Baker 1918,
[illegible] 1918, Allen 1919, [illegible] 1920,
[illegible] 1920.

① Vestal 1913. Local Distribution of Grasshoppers.
Biol. Bull. 25:141

[illegible] Klugh [illegible] (p. 367)

"Life forms, even if they provided us with a basis for the classification of plant communities, are entirely inadequate from the zoological standpoint."

[illegible]

[illegible]

[illegible] life-forms almost everywhere exist side by side [illegible], natural classification [illegible] we are driven back to the vegetation as the only possible basis [illegible]

(Klugh [illegible])

Klugh [illegible] succession [illegible]

1. [illegible] evolution [illegible] static nature [illegible] (p. [illegible])
[illegible]
2. [illegible] of succession [illegible] progressive [illegible]
[illegible] retrogressive [illegible]
[illegible] basis [illegible]
3. [illegible] animal ecologists [illegible] habitat [illegible] ([illegible])
[illegible] probability [illegible] basis [illegible] [illegible])

* Kenoyer [illegible] p.411. Griesebach ('72) said, 'I give the name 'formation' to a group of plants, [illegible] …, that has a fixed physiognomic character.

Terminology

p. 365

Community has come into general usage as the preferred designation for an ecological division of unclassified [illegible]

Society has been quite widely used in the same general sense as community by some authors, though it has been used in a specific sense by other authors, [illegible] [illegible]s. (somewhat modified)

Zone is ~~[illegible]~~ a useful general term for plant communities which exhibit a well-marked concentric or parallel arrangement, as peat-bogs, some lake-margins and mountains.

Formation, first proposed by Griesebach (1838) for a group of plants, such as a meadow or a forest that has a definite physiognomic character.' *

[illegible] specific sense for ~~the~~ communities [illegible] [illegible] [illegible] large unit [illegible] small vegetation, [illegible] [illegible] specific sense [illegible] [illegible] ~~[illegible]~~ [illegible]

[illegible] 1910年, Brussels Congress で

'A plant formation is the actual expression of certain definite conditions of life. It is composed of associations which differ in their floristic composition but are in agreement, firstly with the conditions of the habitat and secondly as regards growth-form.'

[illegible] association, convenient grouping [illegible]

[illegible] (1920)

'The term formation is applied to a set of communities related developmentally and culminating in one or more associations' (p.368)

[illegible] sea [illegible] various [illegible] streams [illegible]

[illegible] Knight [illegible]

formation [illegible] association, artificial grouping [illegible] [illegible] [illegible]

Association ~~[illegible]~~ Humboldt (1807) の 'plantae sociales' [illegible]

[illegible]

Brussels Congress では

'An association is a plant community of definite floristic composition, presenting a uniform physiognomy, and growing in uniform habitat conditions. The association is the fundamental unit of synecology.'

[illegible] the association is a community of definite [illegible] composition living in uniform habitat conditions
[illegible]

[illegible] association [illegible] [illegible]
[illegible]

ecotone [illegible] (Clements). [illegible] boundary [illegible]
[illegible] region

Nichols, G.E. 1923 Working
basis for the ecological classification
of plant communities.
Ecology 4: 11-23, 154-180.

Nichols. Ecology 1923

[illegible]

[illegible] vegetation [illegible] plant community [illegible] physiognomy [illegible] general outward appearance [illegible] external morphology [illegible] deciduous forest [illegible] physiognomy [illegible] community [illegible] life-form [illegible] more precisely, it is determined by the character and structure of the dominant life-forms. The term life-form is here used [illegible]

[illegible] form [illegible] visible expression [illegible]

[illegible] ~~[illegible]~~ physiognomy [illegible] shrubby [illegible]

Nichols. ecological structure [illegible] morphological [illegible] physiological [illegible] adaptations [illegible] structure [illegible] structure, function [illegible]

Floristic composition [illegible] physiognomy [illegible] dominant life-forms [illegible] dominant species [illegible]

[illegible] dominants ハ一般ノモノニ二段ノモノデアル。一[illegible] consociation [illegible] association [illegible]
Sinc, association ヲアラハスニ physiognomy ニヨラヌ、[illegible] dominant life-form ニヨリテ subordinate rank ノ life-form [illegible] 'subdominant' (dominant [illegible] undergrowth [illegible]), [illegible] physiognomy ト vegetation ノ external morphology [illegible] subdominant [illegible] internal morphology [illegible]。

[illegible] Association ハ vegetation ノ fundamental unit [illegible] organic entity [illegible]。

Habitat ノ定義

[illegible] (Congress)
everything relating to the factors operative in a geographically definite locality, so far as these factors influence plants.

[illegible] (1905) ハ
It is the exact equivalent of the term environment, though the latter, is commonly used in a more general sense.

habitat トイフト、住処、ground station [illegible] kind of situation [illegible] idea ガ含マレテヰル 即チ 立地、生育地 トイフ言葉ノ[illegible] (Standort)
In a general way, it can be applied to areas of any description, such as north-facing slopes, ravines, flood plains, or salt marshes, which are characterized by uniformity with regard to certain particular environmental conditions.

ecologically ニ見ルト 一ツノ ~~com~~ plant community ハ ソノ environment ガソノ community ノ存在ヲ許スカラ成立シテヰルノデアル 或ヒハソノ存在ヲ許スヨウナ条件ヲ具ヘテヰルカラ、ソコニ、ソノヨウナ community ガ出現シタノデアル」即チ habitat ガアッタカラ ソノ結果トシテ community ガ成立シタノデアル。ソシテコレハ一ツノ定理ト ~~[illegible]~~ 考ヘラレテ来タ
適当ナ

[illegible] community [illegible] community [illegible] habit[illegible]
[illegible] environmental condition [illegible]
[illegible]

[illegible] (p. 15) [illegible]
[illegible] vegetation is essentially homogeneous ...., it follows [illegible] habitat must also be homogeneous throughout the area [illegible] occupied [illegible]. [illegible] be accepted as a logical corollary to the definition of plant association.
[illegible]
[illegible] definite floristic composition [illegible] uniform [illegible]

[illegible] habitat [illegible] stratum [illegible] habitat [illegible] layer [illegible]
[illegible] stage [illegible] succession [illegible]

Shelford 1913

Shelford 1911 structure [illegible] function [illegible]

This revival of an old idea that animal species arose in places and by methods unknown, and by chance found places to which they were adapted, now constitutes the central idea of the most recent theory of the origin of adaptation and is to be favored as a working hypothesis, because it may be tested experimentally.

Another reason for the inadvisability of attempting to classify ecology on the basis of structure lies in the fact that structural changes resulting from stimulation by the environment are rarely of advantage or disadvantage to the animal, and further that the structure of mobile animals is not readily modified by the environment. A considerable number of animals are larger or smaller, lighter or darker, according to conditions surrounding them during development, and few biologists see any advantage or disadvantage to the animal in these changes.

Different organisms usually ~~quite similarly in~~ behave differently in some respects, while their communities may behave quite similarly in other respects.
31, § 5, [illegible]

31. The only reason to be assigned for the irregular or local distribution of the animals is that they are not in physiological equilibrium in all the places. However, some animals move about so much that it is with some difficulty that we determine what their true habitats are.

The activity which determines the range of conditions under which a species will be successful is the activity which takes place ~~[illegible]~~ within the narrowest limits. This is usually the breeding activity. The breeding instincts are the center about which all other activities of the organism rotate, and the breeding-place is the axis of the environmental relations of the organism.

p. 32
We have noted reasons for not putting primary emphasis on structure and form as a basis for the organization of ecology. The above discussion ~~always~~ shows that activities are actually most important, and accordingly may be used in ecological study. However, since structure and activity (function) are always correlated, we should never lose sight of the former.

p.32. Ecology is that branch of general physiology which deals with the organism as a whole, with its general life process as distinguished from the more special physiology of organs. With these limitations upon the term physiology, what may be termed physiological life histories covers much of the field.

p.33. biota = animal community + plant community; all the life is a biota.

p.34 It follows that there is often a certain physiological or ecological similarity in the species which select the same or similar habitat.

p.35. The habitat is the world into which the organism fits,
[illegible]

Classification of communities

[illegible] Grouping must thus far have been based upon similarity of habitat. Habitat likeness have in general been based upon general conditions. General conditions have not always been accompanied by similar physical conditions. In general there has been an agreement in the recognition of strata, of associations as communities based upon minor differences in habitat, and formations based upon larger marked differences in habitat.

[illegible]

p.33 Formations are groups of physiologically similar associations. Formations differ from one another in all strata, no two being closely similar. The number of species common to two formations is usually small (e.g., 5 per cent). Migrations of individuals from one formation to another are relatively rare.

Extensive formations are groups of formations closely influenced by a given climate in the case of land formations and by the topography of the edge of a large ocean and by climate in the case of aquatic formations.

Shelford's swift-stream community [illegible] p.94, Fig. 33 [illegible]
[illegible] described in [illegible]

Under the stones [illegible] ~~[illegible]~~ Here are [illegible] p.96) May-fly nymphs, the flattened Heptageninae, and the more or less rounded Siphlurinae, ~~[illegible]~~ evidently succeeding well together. This fact makes the value of the flattening as an adaptation appear nil. [illegible]

Shelford's genetic ecology of streams

[illegible] Bull. [illegible] (1911)
[illegible] climatic change [illegible]
[illegible]
Succession [illegible]
[illegible] community [illegible]

p.111 Here it is based on the superposition of all the fish communities over the oldest part of the oldest and largest stream.

i.e. [illegible] habitat [illegible]
old ~~[illegible]~~ habitat [illegible] community of [illegible]

Forest formation.

17. In the higher portions of the tamarack swamp are found several species characteristic of beech woods and other mesophytic woods. These indicate that beech and maple are to follow.

[illegible]

[illegible] 1926, vol. VII, p. 503 = G. I. Jones [illegible] Pearse 'Animal Ecology' [illegible] community classification [illegible] 'The only classification of communities [illegible] is admittedly a classification of habitats, and it is nothing more [illegible] Shelford 1913 [illegible] physiography [illegible] habitat [illegible] Comstock 'Insect Life' [illegible] natural history [illegible]

[illegible] 'Because of ignorance of animals themselves, it was, [illegible] logical thing to use habitat as the sole basis for [illegible] classification [illegible], but that is no longer true' [illegible] 'After a long and [illegible] attempt to classify animal ~~communities~~ communities on the basis of [illegible], it has ~~[illegible]~~ become clear that the only successful way to determine limits of animal communities is by the use of data on the [illegible] animals themselves' [illegible] Shelford 1925 [illegible] must be determined by dominants rather than habitat; the limits of the dominants such are the limits of the community' [illegible]

dominant [illegible] 'a dominant is an organism so outstandingly [illegible] adjusted to a given set of conditions that it becomes controlling wherever these conditions occur' [illegible] 'the whole range of conditions [illegible] throughout which a given species is dominant, is essentially uniform ecologically, since ecology is concerned with only those differences that [illegible] life.' [illegible] community [illegible] limit [illegible] dominant [illegible] Shelford [illegible].

[illegible] Jones, [illegible] ecology, physiology [illegible] natural history [illegible] science [illegible]. The idea of [illegible] and puts each one of the whole [illegible] in its proper place with reference [illegible] Jones. Terminology [illegible] usually applied to a definite community [illegible] of the same species throughout, not to a general [illegible] ecologists must eventually settle upon [illegible] plants and animals are included in the [illegible] inadequate. There is no reason [illegible] plant [illegible] the same classification [illegible] so far has been the ecologists so [illegible] time as yet to get an adequate background [illegible] Shelford [illegible] in [illegible]

[illegible] 29. 1935.

Shelford 'Habitat' definition [illegible]

As has already been implied, the locality or region of [illegible] the locality or region in which the animal is most [illegible] is called the habitat (ecological [illegible]) [illegible] ecological or local distribution, and the [illegible] distribution [illegible] to extensive areas.

p. 904: If these statements are borne out by [illegible] investigation it follows that every study of animal behavior [illegible] to measured physical factors or the natural [illegible] closely related to problems of distribution.

動物, 植物 [illegible]

[illegible] p. 305: "the activities of [illegible] correspond roughly to the growth form phenomena in [illegible] plants [illegible] Shelford, Physiological animal geography, p. 593) [illegible], all the way through the study of ecology we look for behavior or [illegible] differences in motile organisms (chiefly animals), when considering species of two different habitats, while, when making a comparison of [illegible] organisms (chiefly plants) of two habitats, we look for differences in form and structure. *(Shelford) [illegible]

Grinnell, J. On California's life zone schedules.
factors to be consulted in the dispersal of life
Life types
Primary forms
aquatic, fossorial, terrestrial, arboreal, volant.
Secondary forms
Character of habitat
Manner of walking or reproducing
Direct physical barriers.
Oceans, rivers, etc (to land forms)
land masses, mountains, etc (to aquatic forms)
forests, plains, deserts, etc
protective cover
Vegetation by [illegible]
Zonal
Latitude
Altitude
Barriers, etc
Ocean currents
Prevailing winds
Seasonal
Humidity
Temperature
Mean temperature during [illegible]
lowest minimum
highest maximum
Saturating temperatures
(as [illegible] under [illegible])

ocation of near mountain masses, if any
location of near bodies of water, if any
insolational
degree of insolation, effect of fires and avalanches.
presence of cold streams or springs
topographical situation
slope aspect, slope angle, base level
Soil
chemical and mechanical character.
color, moisture
Food
general and specific character, feeding habits
Enemies
passive (competitive forms)
active
Irritating
exterminating
directly predaceous
poisonous foods
bacteria, protozoa, etc.
~~literature~~
Grinnell, J. 1914 Barriers to distribution as regards
birds and mammals. Amer. Nat. 48 p [illegible]

~~Grinnell, J. 1917 Field tests of theories concerning distributional control. Amer. Nat., 51, p. 115~~
~~[illegible] [illegible] [illegible] [illegible] [illegible] Tsuga [illegible] Washington. Ecology II, 189~~

Shelford '13 General Discussion III. agreement between plants and animals.

p. 305. Logically, ecology cannot be divided into plant and animal ecology, but it may be divided into the ecology of sessile and motile organisms.

[illegible] ecological [illegible] of the community [illegible]

[illegible] The physiological life history aspect of plant ecology is parallel with the same phenomenon in animals, but the activities of motile animals correspond roughly to the growth form phenomena in sessile plants.

[illegible] ecological [illegible] in ecological [illegible] Raunkiaer's 'life form' [illegible] the growth form [illegible]

[illegible] agreement of [illegible]

Are physical conditions sometimes similar when vegetation and landscape aspect are very different? That they are is clearly suggested when we compare the forest and the shrub-covered bluff where forest animals occur.

[illegible] plants [illegible] very limited range of conditions [illegible] favorable condition [illegible] a great range of [illegible] tree [illegible] activity [illegible]

p. 306. These facts suggest that there are two types of cases in which physical conditions and forest conditions are not in accord. In the first case atmospheric conditions become favourable for forest animals before any woody plants have been able to grow; in the second, woody plants remain after conditions have become unfavorable

[illegible]

for forest animals, both are due to lagging behind of vegetation, both are very local and minor significance.

[redacted]

p.306 If Epeira domicilorum is a species of stable physiological makeup we can offer no explanation for its peculiar distribution. In this way many species are found to occur in what at first appear to be very unlike situations. ... Such species as the bugs mentioned above are said to occur "everywhere", although they .. may always live in similar conditions.

[redacted]

p.307 Some investigators have questioned the importance of vegetation to animals and we note here that the distributions of ~~plants~~ plant and animal species are not always correlated. If one refers to species of plants and species of animals then the vegetation very often is not correlated with the distribution of the animals.

[redacted]

p.308 In these cases, however, conditions are only temporarily out of ~~disagr~~ adjustment, due to rapid physiographic changes, and we note from the data presented that plant and animal communities are usually in agreement. The exceptions are often appearent only and due to the emphasis of species ~~island~~ instead of mores and growth form. From this viewpoint and with such exceptions as are noted, plant and animal communities are probably in agreement the world over.

[redacted]

Shelford '13 succession → Relations of communities.

p.308 Succession is no doubt one of the most important and widespread of the phenomena discovered by the ecologists up to the present time. Simply stated, it means that on a given fixed area organisms succeed one another, because of changes in conditions. The changes referred to result from physical or biological causes, or combinations of the two. It is probable that the causes of the changes are frequently complex combinations of various factors.

[illegible]

p.309. When will the process of succession stop? Obviously, it must cease when there are no available species to take the places of those which have destroyed their own habitats ([illegible]). There are species which are immune to their own products and the products of the species which are associated with them. Obviously, when a condition in which these species can live is reached, and they came to occupy the place which is thus made ready for them, the formation which they constitute can, so far as the plants are concerned, last indefinitely. This is theoretically true of all climax or geographical formations, and has been established for the beech and maple forest of eastern America.

[illegible]

p.311 Theoretically at least, in all the varied types of land habitats of any large area, communities are tending toward some one type which is primarily adjusted to the climate of the region when its topography approaches base level.

[illegible]

[illegible]

correspondence of communities of different parts of the world

[illegible] correspondence [illegible]

see Shimper,

[illegible]

[illegible]

* [illegible]

[illegible] p. 313 On the animal side we have less trustworthy evidence of similarity or correspondence. [illegible] If the physiological similarity occurs in the same community*, . . , we conclude that it occurs in all communities occupying similar conditions and that similar situations in different parts of the world have physiologically similar communities, and identical situations approximately identical communities. [illegible]

[illegible]

[illegible] a) the existence of identical or closely corresponding species has long been known to naturalists. [illegible]

[illegible] identical or closely [illegible] physiological similarity [illegible] structure [illegible] c) certain animals in similar environments in different parts of the world appear from the accounts of naturalists to behave alike . . . . . For example, it appears that there is a close physiological and ecological similarity between certain antelopes of the savannas of Africa and certain savanna kangaroos of Australia. In other words certain kangaroos are ecologically and physiologically similar to some antelopes.

[illegible]

[illegible] African [illegible]

✓

[illegible] p. 314 These specificities of behavior are matters of little ecological significance; it matters not if one animal progresses by sommersaults so long as the two are in agreement in the matter of reactions to physical factors as indicated by the manner of spending the day, ..., and in the mode of meeting ~~[illegible]~~ enemies .. ... [illegible] specificity [illegible] all the environmental [illegible] ecological [illegible]

[illegible]

p. 315 In matters of correspondence of species there are often striking correspondences ~~which~~ within the groups of formation indicated above. For example, there is a striking correspondence in behavior between the meerkats of the steppes of East Africa and the prairie dogs of our own steppe, both being grasslands but differing in climate, [illegible] formation [illegible] formation + life zone [illegible]

Origin of [illegible]

[illegible] ecological characters [illegible] taxonomic [illegible] physiological [illegible] physical factor [illegible] reaction [illegible] ecological [illegible] preference [illegible] reaction [illegible] P.316 Such, however, can hardly be strictly true, but we cannot see what the real reactions may be. If our point of view is correct the ecological characters of a race experimentally segregated, or experimentally produced, must in practice consist ~~primarily~~ [illegible] physical factors [illegible] entire environmental complexes [illegible] reaction,

[illegible] definite rate of metabolism, [illegible]

[illegible] specificity of behavior,

[illegible] structural characters modifying behavior [illegible]

p. 317 Relatively fixed taxonomic integumentary characters have no bearing on ecological matters, not even according to the broadest definitions of the subject.

[illegible] structure [illegible] ecological standpoint [illegible] structure [illegible] taxonomy [illegible] showing ecological similarity in organisms structurally and phylogenetically diverse. It therefore provides a new and different means of organization of data. In this work we have sharply separated evolution and structure, on the one hand, from physiology and behavior, on the other.

[illegible]

p. 317 While it may be expedient to continue in this manner until our knowledge of physiology and behavior is commensurate with that of the other subjects, the following of such a course indefinitely, with respect to either morphological or physiological aspects of biology, cannot, if it be general, bring about the best development or unification of biological science.

[illegible]

p. 518 We classify the responses and changes in animals as evolution, modification by the environment, behavior, and physiological response. ~~All~~ Are not all these, after all, but different expressions of the same or similar process? Future investigations must answer this question, and it is arround this question that the future of much that is known as biological hinges.

Cooper 1926.

Cooper, W. S. 1926.
Fundamentals of vegetational change. ~~Jour. Ecol. 22: 39-68.~~
Ecology 7: 391–413.

[illegible] historical [illegible]
[illegible] Darwin [illegible] to vegetational change [illegible]
[illegible] (45) Warming [illegible] p.392 citation) 'In early times plant societies were looked upon as stable groups which were in a state of quiescence, complete in their development, and peacefully living side by side. In reality no such relations exist in the plant world. Everywhere and continuously there is going on a struggle between plant societies, each small change in the living conditions immediately produces shiftings and changes in mutual relations of these groups.' [illegible] Cowles [illegible] dynamic ecology [illegible] Clements 1916 'Plant Succession' [illegible] evolution [illegible]

p. 393 The greatest contribution of all, however, is the extension of the field of study to cover all time from the present moment back to the very beginnings of vegetation upon our planet. The idea that the laws which govern contemporaneous changes apply also to those of the past was certainly implicit in the work of Cowles and others, and a number of investigators had made profitable ecological incursions into the past, but Clements was the first to organize the field of dynamic ecology as a unified science covering the entire history of the plant population of the earth.

[illegible] Tempest [illegible]

[illegible] data [illegible] vegetational history [illegible] floristic composition [illegible] quantitative form [illegible]

Results at best will be meager, it is true, but quantity, though desirable, is not the ~~m~~ only thing that gives value to scientific data. [illegible] is an organic entity [illegible] Cooper [illegible] This assumption colors the whole of Clements' treatment, and, in the opinion of the writer, detracts seriously from the usefulness of his contribution. [illegible] individual [illegible] Cooper [illegible]. This is all true – but not the whole truth. Assemblages of plants or animals are subjects to special laws, so that their mass action is not equivalent to the sum of the action of the component individuals. .... Incidentally, Gleason protests vigorously against unwarrantable framing of rigid, subjective concepts.

[illegible] succession [illegible] p. 395 [illegible] climatic [illegible] ~~physiologic~~ physiographical [illegible] process [illegible] slowness [illegible] data [illegible] dynamic ecology [illegible] Cooper [illegible] succession [illegible] geologic [illegible]

things that they are [illegible] things in process of change [illegible] things in process [illegible] things [illegible] things [illegible]

The Foundation

p. 396. The strictly logical procedure would be to include the animal life, as it becomes more and more evident that plants and animals together constitute our 'communities' – that the distinction between purely plant and animal communities is an artificial one. I believe, however, that the fundamental conclusions here presented may be applied with equal truth to communities of animals and of plants, and to the more natural units in which both are included.

[illegible] conclusion [illegible] ~~parallelism~~ parallelism [illegible] vegetational change [illegible] organism [illegible] environment [illegible] p.398 Evolution, a function of both vegetation and environment, is mainly responsible for the course of the great vegetational stream as a unit.

[illegible] The Superstructure [illegible] communities [illegible] succession [illegible] the community [illegible]

p.389 First of all, then, the advancing termini of the streamlet-elements constitute the 'communities' of the present. [illegible] communities [illegible] It is possible and convenient to distinguish various kinds and ranks of communities, and thus to erect systems of classifications upon sundry bases. Discussion of these does not come ~~at~~ within the scope of this paper.

[illegible] Is [illegible] an Organism? [illegible] Clements, 'the developmental study of vegetation necessarily rest upon the assumption that the unit or climax formation is an organic entity. As an organism the formation arises, grows, matures, and dies (Plant Succession, p.3)'. [illegible]

[illegible] p.400 The vegetational processes which are asserted to be identical with those of individual organisms, especially growth, death and reproduction, are merely analogous. As an illustrative comparison the parallel between vegetation and organism is allowable; as an important stone in the foundation of a system, it is totally unjustified.

[illegible]

[illegible] succession [illegible] succession [illegible] Clements [illegible] vegetation [illegible] organism [illegible] infancy [illegible] maturity [illegible] [illegible] destruction [illegible] progressive succession [illegible] regressive [illegible] succession [illegible] process [illegible] change [illegible] p.402 Such changes, however, are developmental not because the vegetation unit is an organism but because it is made up of organisms undergoing development. [illegible] community [illegible] succession [illegible] species [illegible] succession [illegible] "section" [illegible]

[illegible] succession [illegible] species [illegible] species [illegible] phase [illegible] climax [illegible] species [illegible] fauna [illegible]

[illegible] p.1052 Climax [illegible] Cooper [illegible] climax [illegible] climax [illegible] p.407 ~~they were~~ The very term 'climax', and certain other words descriptive of it, such as 'final', 'ultimate', 'culminating', 'Schlussverein', 'Endstadium' are unfortunate in their connotation of finality.

They tend to crystallize the idea into a something ~~able~~ stable and unchanging, the ultimate goal where the restless elements of the vegetation finally attain repose. [illegible] Clements [illegible]

[illegible] the condition of equilibrium is never reached, . As a matter of fact we have a variable approaching a variable rather than a constant.' [illegible]

[illegible]

[illegible] p. 908

Clements ('16) has given us the idea of the 'subclimax,' which Nichols has cast in a more rigid form as the 'edaphic' or 'physiographic climax'. In this, ~~ot~~ vegetational change slows down markedly at a point short of the climatic climax, that is, before the entry of one or more of the concluding stages, which, according to Nichols, are permanently excluded by limiting factors residing in the soil. . . . . The subclimax or physiographic climax is a useful concept if not made too rigid. Like the climatic climax it is an approximation, ~~and even less definite,~~ . . . .

[illegible]

p. 909 In relation to climax he distinguishes succession on the basis of the assumed degree of progress they are able to make toward the attainment of the climatic climax. All of these 'kinds' of succession I would reduce to 'phases' of the great stream. [illegible]

[illegible] p. 911 It comes ~~when~~ into being insensibly, much

---

the unit succession being characterised by a gradual diminution of the rate of change. The climax may continue long enough to permit a direct, gradual transformation due to climate and evolution. [illegible]

[illegible] second [illegible]

Succession is the universal process of change which is embodied in the great vegetational stream; all vegetational changes, whether internally or externally induced, whether gradual or abrupt, are therefore successional.

[illegible] Clements [illegible]

[illegible] 1929 [illegible]

~~Cook, W. C. A bioclimatic zonation for studying the [illegible] economic distribution of injurious insects. Ecology 10: [illegible] - 293~~

ackleford, M. W. Animal communities of an Illinois [illegible].

~~[illegible] & Eddy Methods for the study of stream communities.~~

1929 vol. 10.

~~Smith, Animal communities of a deciduous forest succession~~

[illegible]

~~[illegible]~~

~~[illegible] 1923 Animal ecology [illegible]~~

[illegible]

[illegible], 1929 Plant physiognomy.

Ecology, 10: 407-414.

[illegible]

p.407 As the visible structure or external morphology of a plant is the basis of its classification . . . . . . so the aspect or appearance of a plant society is the natural point of approach in social plant ecology. [illegible] Kerner('63) designated as 'Beständé' related plant-masses of the same life-form, such groups as trees, shrubs, brush and the like. A number of such layers or components constitute a formation. [illegible]

[illegible] (p.410)

p.410 Such floral analysis is of floristic rather than physiognomic interest, for the spectrum, as Raunkiaer himself states, gives us little idea of the vegetational aspect of a region. [illegible]

[illegible] we might use first of all the life form of the one or more dominant species; i.e., those that grow tallest and are most numerous in the ~~of~~ upper stratum. Thus we could decide whether a tract is occupied by forrest, scrub, grass, high or low herbs, and the like. Next we could consider the more evident ecological characters. Is our forest deciduous, broad-leaved evergreen or narrow-leaved evergreen?

[illegible]

[illegible] external [illegible] vegetation [illegible] aspect [illegible] ecological structure [illegible] internal [illegible] stratum [illegible] Kerner [illegible] formation [illegible] herb [illegible] layer [illegible] formation [illegible] ecological [illegible] unit [illegible] life form [illegible]

[illegible] succession [illegible]?

layer [illegible] succession [illegible]

[illegible] layer [illegible]

[illegible]

[illegible] !!

[illegible] layer [illegible]

✓ [illegible] succession [illegible] competition [illegible] !

[illegible]

[illegible] Kenoyer, L. A. [illegible] general and successional ecology of the lower tropical rain-forest at Barro Colorado Island, Panama, [illegible]

Ecology, 10: 201-222, 1929.

Dice, 1923

[illegible], biotic areas, life zones, formations, etc. in [illegible]

p. 335 Zoogeographers have long made use of floral and faunal areas in the statement of distribution, and the importance of the use of [illegible] is generally conceded. Some ecologists are practically in agreement with designations as 'climatic formation' and '[illegible] formation'. The best term available to indicate the concept of [illegible] seems to be biotic area. A biotic area, then, may be defined as a geographic district, characterized by an assemblage of species and of ecological characteristics differing from those found in adjacent areas. A biotic area will usually [illegible], the climatic area and will [illegible] a [illegible] physiography as well.

The animal species found in a biotic area constitute its fauna; the plant species found in the same area constitute its flora; and the combined animal and plant species of the area may be termed its biota.

It has been generally assumed that the units of classification in ecological distribution and the units of geographical classification belong to different categories and cannot be used together. However, I see no reason why the units of ecological classification, the ecologic community, cannot, for the exact statement of distribution, be combined with the units of geographical distribution, the biotic area as above defined. In fact, I firmly believe after considerable experience in the use of this combination in the field, that it forms an excellent method of stating distribution.

By this method each biotic area is considered to be made up of a number of ecological habitats, the animals and plants of each habitat forming an ecologic community. (See p. 336) The communities, then, may be considered as a subdivision of a biota, with the same geographical limits. Some communities are extended over two or more adjacent biotic areas, and they may receive the same name in the various areas in which they occur. But no community is likely to be exactly the same in two biotic areas, for between the various areas there are certain general differences in the fauna and flora, and usually also in climate and physiography.

The discrimination of biotic and ecologic communities is not [illegible]. We must recognize at once that there are no sharp divisions in nature, and that the lines we draw must in many cases be arbitrary. Communities or biotas which are very distinct when typically developed, at their edges frequently shade or gradate into adjacent ones.

Probably the best criterion for characterizing biotic areas is the presence of particular habitats. It is evident that in passing from one area to another a situation will be met where the dominant habitat [illegible]

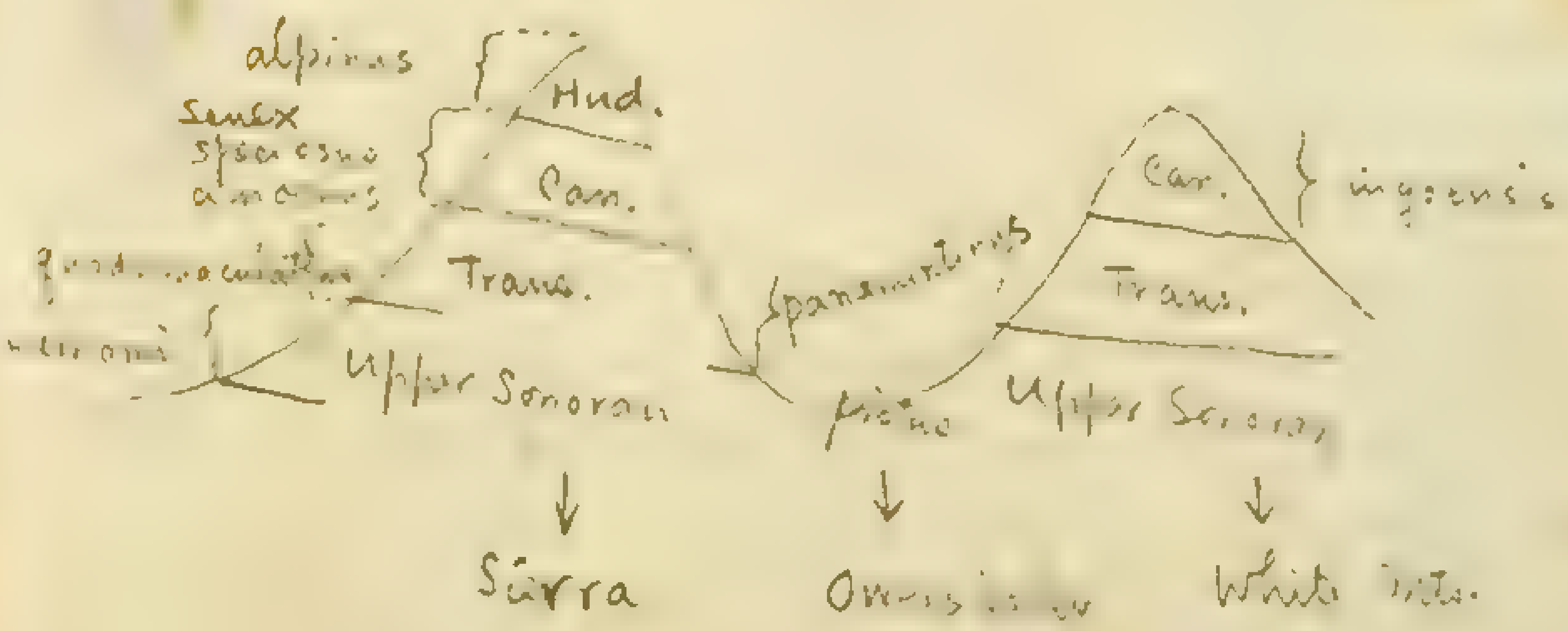
[illegible] [illegible] will [illegible] to [illegible] the dominant [illegible] of the [illegible],
[illegible] the [illegible] that [illegible] [illegible] [illegible] [illegible] distribution,
[illegible] [illegible] boundary [illegible] [illegible] overlapping
[illegible] [illegible] [illegible] boundary? [illegible] [illegible]
[illegible]

[illegible] [illegible] distinguishing character in vegetation [illegible]
[illegible] [illegible] [illegible] [illegible] vegetation dominant
[illegible] [illegible] [illegible] [illegible] index [illegible].
[illegible] [illegible] [illegible] smaller animal communities
[illegible] [illegible] distribution [illegible] smaller plant communities
[illegible] [illegible] [illegible] [illegible] that the smaller divisions of
ecological communities will be different for animals and plants,
[illegible] [illegible] that smaller communities will differ [illegible]
different groups of animals. It will be [illegible] [illegible], [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] the plants [illegible]
[illegible] [illegible] [illegible] [illegible] distribution.

[illegible] [illegible] [illegible] distributional classification based on
[illegible] [illegible] [illegible] [illegible] such as temperature, as
[illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] [illegible] [illegible] of classification
[illegible] [illegible] [illegible] [illegible]. [illegible] the facts of distribution [illegible]
[illegible] [illegible] [illegible] [illegible] and ecologic communities
[illegible] [illegible] [illegible] [illegible] [illegible] important.

[illegible] life zone [illegible] [illegible]. I would emphasize, therefore, the need for a precise statement of distribution in terms of units which are capable of combination into a number of possible systems of classification, rather than to describe distribution in terms of [illegible] and relatively unstable biogeographical regions, life-zones, or ecologic formations.

Merriam '06, p. [illegible] [illegible] Eutamias, eastern California [illegible] zone ranges [illegible]



[illegible] associations and habitats of the [illegible], [illegible]

Lee, L. M. 1923. Ecology 4: [illegible]

Hudsonian or Spruce Zone

Neutral or Transition Zone

Habitat and association Species	Beach	Marsh	Cottonwood -Birch	Engelmann spruce	[illegible]	[illegible]	Yellow pine	Burned	Burned	[illegible]	Alpine	[illegible]	[illegible]
Neosorex navigator navigator	x	x								x			
Peromyscus maniculatus artemisiae	x		x	x	x	x	x	△□ x		x	x		
• Microtus longicaudus mordax		x											
Ondatra zibethica osoyoosensis		x											
• Zapus princeps princeps		x	x		x								
Mustela vison energumenos		x											
Castor canadensis [illegible]		/											
[illegible] americanus [illegible]		/											
• Eutamias quadrivittatus [illegible]			x		x	x	x	△□	x				
Lepus bairdii [illegible]			x	x	x	x	x		x	x	x	x	
[illegible] sp			x		x	x	x		x	x	x	x	
• [illegible]				x		x							
[illegible]				x	x	x					x		
• Sciurus [illegible]				x	x	x	x						
• [illegible] saurinus [illegible]				x	x								
[illegible]					x	x	x						
Mustela sp.					/								
[illegible]					x								
Canis latrans lestes							x	x					
Felis oregonensis hippolestes							x						
Citellus columbianus columbianus							x	△ x		x	x	x	
Thomomys [illegible] fuscus								x					
• [illegible] vulpinus										x	x	x	
Oreamnos montanus missoulae										/		x	
Marmota caligata nivaria												x	
[illegible] princeps												x	
• [illegible]													x
• Neotoma cinerea cinerea								□					
• [illegible] mordax mordax								□					

△ = Clearing Habitat and association [illegible]

□ = Edge [illegible] " "

No. 7 '12

[illegible]

[illegible]

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Ist order
IInd order
IIIrd order
I I I I II II III III III III

V. E. and Towler, E. D.
Shelford 1925 Animal communities of the San Juan channel and adjacent areas.
Puget Sound Biolog. Sta. Pub. 5: 33-93.

p.43 The controversy as to whether associations of organisms ar

E. D. Sanderson (see [illegible])
p.53 Tent caterpillar has but one generation both in the North and South, hibernating over winter in the egg in which the larva is completely formed. The critical point must be much higher in the South, for the low temperatures which are effective in the North are [illegible] reached in the South.
p.59 - p.61
indigenous to the more temperate climates, have but one generation in the south, while southern species have many generations in the South, but the number decreases as they spread northward. Why should not all have several generations in the South?

The preceding efforts at determining communities on the basis of dominants is to be regarded as tentative, not in principle, ...
p. [illegible]

Subj.	Auth.	Lit.

V. E. and Towler, E. D.,

Shelford 1925. Animal communities of the San Juan channel and adjacent areas.
Puget Sound Biolog. Sta. Pub. 5: 33-73.

p. 43 The controversy as to whether aggregations of organisms or

Sanderson (see Needham) [illegible]

p. 253.

[illegible]

p. 257

1. Upper [illegible] [illegible] west [illegible]
2. [illegible]
3. [illegible]

[illegible]

[illegible] The preceding efforts at determining communities on the basis of dominants is to be regarded as tentative, not in principle, ...

[illegible]

Subj. Auth. Lit.

Shelford, V. E. and Towler, E. D. 1925 Animal communities of the San Juan channel and adjacent areas.
Puget Sound Biolog. Sta. Pub. 5:33-[illegible]

p. 43 The controversy as to whether aggregations of organisms or habitats, i.e., the obvious conditions, should be used as a basis for communities is an outgrowth of a lack of knowledge of communities. [illegible] Meanwhile the senior writer's experiments and field experience have led definitely to the conclusion that the distribution and abundance of animals is the best index of conditions obtainable.

[illegible]

[illegible]

p. 44 While there are physiological differences ~~ots~~ with depth even ~~the~~ within the dominants, they no doubt represent the extent of acclimation within the species. As compared with the large differences between animals of the Balanus-Littoria formation and the green sea urchin-Argobuccinum formation, these differences are very slight.

[illegible]

p. 65 Some fallacious results of the method using the habitat to designate communities instead of the communities themselves .....

[illegible]

[illegible] The preceding efforts at determining communities on the basis of dominants is to be regarded as tentative, not in principle, ..

[illegible]

p.66 At any rate it will be granted that to appreciate the biological relation it is necessary first to find those species which dominate and control the habitat (dominants); second those which are present seasonally and locally and of secondary impotance; and finally those which are rare or scarce and of little significance.

[illegible] A dominant species is one which through abundance, size or interaction with other organisms, control or materially modifies the environment so as to determine what other organism may occur (p.33).

[illegible] habitat [illegible]
[illegible]
[illegible] (p.66), [illegible] animal [illegible]
[illegible] (p.66) [illegible] animal communities.
[illegible]

p.67. 1. the absence of large stationary, obviously dominating animals comparable to trees, shrubs and conspicuous herbs (which throw the smaller fungi, algae, mosses, etc, into insignificance).

2. Animal movement, hiding, etc, especially the differences in habitat of different life history stages.

[illegible]

|| p.69 Communities must be determined by dominants rather than habitat; the limits of the dominants as such are the limits of the community.

[illegible]

p.67 [illegible] p.69 = secondary species = [illegible] minor grouping [illegible] quite generally [illegible] irregularity [illegible] ~~detail~~ [illegible] detail [illegible] confusion [illegible] communities [illegible] arrangement [illegible]

p.69 Dominant organisms best illustrate the physiological characters of the community and are the best indicators of the community conditions. Secondary species and uncommon species are of minor significance in ecology (though the chief interest of taxommony and taxonomic surveys)

[illegible] community [illegible] character [illegible] organism [illegible]

[illegible] marine animal [illegible] Balanus-Littorina formation [illegible] Strongylocentrotus-Argobuccinum formation [illegible] Inter-tidal Belt [illegible] Sub-tidal Belt [illegible] habitat group [illegible]!
1913 [illegible]

Vestal, A.G. 1914 The internal relations of terrestrial associations.
Am. Nat. 48: 413–445.

Vestal 1914

* plant [illegible] environment [illegible] structural [illegible] adjustment [illegible] annual [illegible] structural [illegible] physiological [illegible] react [illegible] adjust [illegible] Shelford [illegible]

Vestal [illegible] 'association' [illegible] 'community' [illegible]

p.415 Vestal [illegible] environment [illegible] plant [illegible] animal [illegible] physical, biological [illegible] structural [illegible] physiological character [illegible]

[illegible] structural character [illegible] indicator [illegible] plant [illegible] condition [illegible] environmental adjustment [illegible]

common habitat [illegible] different species [illegible] environmental [illegible] ecological constitution [illegible] equivalent [illegible] organism [illegible] each species [illegible] organism [illegible] physiological [illegible] morphological [illegible] environmental [illegible] Shelford [illegible] Vestal [illegible] p.416 Each organism differs in greater or less degree from others in ecological constitution, and thus selects a different environmental complex. [illegible] habitat [illegible] Vestal [illegible] community [illegible] habitat [illegible] organism [illegible] Vestal [illegible]

* Plant [illegible] environment [illegible]

[illegible] p.417 The structural modifications are most evident in the ~~aj~~ adjustment of plant to external conditions, though these are accompanied by physiological characters which are also in harmony with the environment. [illegible]

[illegible]

[illegible]

[illegible] p.420 Species of restricted food-habits must remain less numerous in individuals than general feeders, as the available food-supply is very much less. (p.420)

[illegible]

p.423 The animal is not adapted to a particular status in the association; its ecological constitution determines what place it shall be able to find among the other animals of its surroundings. The relations among the various animals .... are the result of mutual accommodation on the part of all the animals involved.

[illegible]

[illegible]

[illegible] p.424 Dominant signifies more than mere ability of a species to thrive in its surroundings. The species of greatest influence are those on which the greatest number of other animals depend: [illegible] p.425 Dominant animals appear to be those of moderately specialized habits rather than those of highly specialized, or relatively unspecialized, habits. [illegible] (p.427)

[illegible] p.428 Different parts of the space occupied by an association present different environmental conditions. [illegible]

[illegible]

[illegible] p.430 Thus

considered, the character of the plant population of an area is an index to general character, or ecological type, of the animal assemblage. These relations, however, are quite general, lacking detail. ....

geographical distribution

[illegible] Vestal [illegible] 'biotic province' [illegible] p.432 We might expect animal communities to have the same geographic distribution as plant communities, and we might expect the area of the plant provice to be characterized by distinctive kinds of animals as well as by distinctive kinds of plants. The province is thus not simply a vegetation province, but a biotic province. [illegible] p.431. The area of the province is generally uniform in physical conditions. This uniformity is only relative, being subject to general geographic variation in climate, perhaps giving rise to subregions in distant parts of the province .... [illegible] Certain plant species range over one or all of these subregions, still others establishing themselves over the whole area of the province .... [illegible] p.433

Similar associations of two provinces may contain the same or closely related species, ... [illegible] p.433 The plant community has been found by the writer to be the convenient index of the area of the habitat for animals. [illegible] grasshopper [illegible] local distribution [illegible] local distribution [illegible] mobility [illegible] climatic plant community [illegible] formation [illegible] environment [illegible] large number of animals [illegible] conditions [illegible] (p.434) [illegible] p.435. ...the area of animal assemblage is that of the plant assemblage, both resting basically upon the physical environment. The plant and animal assemblage are therefore coextensive part of a biotic association; .... ||

Vestal ~~1924~~ 1914

Shelford [illegible] same general environmental condition [illegible] similar response [illegible] ecological similarity [illegible] growth form [illegible] behavior ~~reaction~~ [illegible] Shelford [illegible] plants and animal communities are in full agreement when the growth-form of each stratum of plant community is correlated with the conditions selected by the animals of that stratum,

[illegible] so that mores of the animal may be in accord with growth-form in the plant [illegible] growth form [illegible] mores [illegible] mores [illegible] plants [illegible] structural responses [illegible] herb form [illegible] ecological similarity [illegible] behavior [illegible] definite [illegible] complex [illegible] Shelford [illegible] Vestal (p.435) [illegible] habitat [illegible] habitat [illegible] plant [illegible] ecological [illegible] p.436 The plant and animal assemblages of given habitat, ~~particularil~~ particularly if climatic and extensive, are usually in general ecological agreement, and the exception are likely to be infrequent or temporary. [illegible] ecological agreement [illegible] habitat [illegible] community [illegible] special [illegible]

[illegible] Vestal [illegible] habitat [illegible] p.435 There is evidence that agreement of plant and animal assemblages of terrestrial associations is often a matter of accomodation on the part of the animal assemblage. [illegible] established association [illegible] p.437 we may conclude that the character of the plant assemblage determines, to a large extent, the ecological type of the animal assemblage. [illegible]

[illegible] animal assemblage; 又ハ a. community
[illegible]

p.437. There is evidence that, in so far as the vegetational environment is concerned, distribution of animals within the association is usually a direct function of similar distribution of plants.

taxonomic composition

[illegible] ecological type [illegible] plant assemblage ハ 又 similar ecological types ノ animal [illegible] characteristic species [illegible] same climatic [illegible] closely related variety 又ハ species [illegible] (p.438) [illegible] identity [illegible] species-in-common [illegible] p.439 associations can hardly be separated or placed together on a statistical basis. [illegible] relation [illegible] identical [illegible] groups of species (p.439) [illegible] p.440 It follows that physical complexes which are alike will become populated with similar complexes of ecological groups, represented by similar collections of plant and animal species, and that unlike physical areas will be occupied by different combinations of ecological groups, and will be composed of different species. [illegible] vegetation [illegible] similar [illegible] identity [illegible].

[illegible] p.441 Within the province or subregion, therefore, it is to be expected that species composition of association of closely similar habitat will be relatively constant, [illegible] ecologically [illegible] taxonomically [illegible], 又 geographically [illegible] Taxonomically [illegible] in fauna [illegible] flora [illegible]

· E. Abstract ·

Gleason, H. A. 1926 The individual concept of the plant association.

Bull. Torrey Bot. Cl. 53 : 7-26

9月31日 [illegible]

[illegible]

Gleason 1926
'individual concept'

[illegible]

[illegible]

[illegible] variation [illegible]

p.10. The essential point is that precise structural uniformity of vegetation does not exist, and that we have no general agreement of opinion as to how much variation may be permitted within the scope of a single association.

[illegible]

p.10 But in many parts of the tropics, where diversity of environment has been reduced to a minimum by the practical completion of most physiographic processes and by the longcontinued cumulation of plant reactions, and where the flora is extraordinarily rich in species, such a procedure is impracticable or even impossible. Where a single hectare may contain a hundred species of trees, not one of which can be found in an adjacent hectare, where a hundred quadrats may never exhibit the same herbaceous species twice, it is obvious that the method of characteristic species is difficult or impracticable.

2. [illegible]

[illegible]

[illegible]

Gleason 1926

3. [illegible]

p.12. It is obvious, therefore, that it is not always possible to define with accuracy the geographical boundaries of an association and that actual mixtures of associations occur.

× transition zone [illegible] species [illegible] p.12. measured by component species such a transition zone rises almost to the dignity of an independent association.

4. time boundary [illegible]

p.13. And just as it is often difficult and sometimes impossible to locate satisfactorily the boundaries of an association in space, so ~~it~~ is it frequently impossible to distinguish accurately the beginning or the end of an association in time. It is only at the center of the association, both geographical and historical, that its distinctive character is easily recognizable.

5 geographical boundary [illegible]

p.14. In any short distance these differences are so minute as to be negligible, but they are ~~cu~~ cumulative and result in an almost complete change in the flora after several hundred miles.

[illegible] organism [illegible] p.16) [illegible] association [illegible] unit [illegible] individual [illegible].

[illegible] negative evidence [illegible] p.18. The average environment may be near the optimum for some species, near the physiological limit of others, and for a third group may occasionally lie completely outside the necessary requirements.

Gleason 1926

p.23. [illegible] area [illegible] vegetation [illegible] plants [illegible] fluctuating & fortuitous [illegible]) immigration [illegible] fluctuating [illegible] variable [illegible] environment [illegible] As a result, there is no inherent reason why any two areas of the earth's surface should bear precisely the same vegetation, nor any reason for adhering to our old ideas of the definiteness and distinctness of plant associations. [illegible] p.24 [illegible] area [illegible] precisely [illegible] same [illegible] chance [illegible] ~~another year~~ [illegible] that chance, may be broken in another year by a continuance of the same variable migration and fluctuating environment which produced it. [illegible]

[illegible] plant association [illegible] area [illegible] ~~vegetation~~ vegetation [illegible] composition [illegible] area [illegible] distinction [illegible] p.25 Under extensitions of this concept it has been regarded as a unit of vegetation, signifying or implying that vegetation in general is composed of a multiplicity of such units, as an individual representation of a general group, bearing a general similarity to the relation of an individual to a species, or even as an organism, which is merely a more striking manner of expressing its unit nature and uniformity of structure. In every case spatial extent is an indispensable part of the definition. [illegible] individualistic concept [illegible] fundamental idea [illegible]

[illegible] primary causes [illegible] migration [illegible] environmental selection [illegible] "social limits" [illegible]

Gleason
1926

sharply + boundary [illegible] primary cause [illegible] abruptly [illegible] (p.26). [illegible] simple [illegible] p26 Since such a condition is of common occurrence, the distinctness of associations is in many regions obvious, and has led first to the recognition of communities and later to their common acceptance as vegetational units. Where the variation of the causes is gradual, the apparent distinctness of associations is lost. ····· In conclusion, it may be said that every species of plant is a law unto itself, the distribution of which in space depends upon its individual peculiarities of migration and environmental requirements. [illegible], rigid definition + logical classification [illegible] impossible [illegible] alternation [illegible] (p.33) [illegible]

[illegible] individual [illegible] successional series [illegible] definite [illegible] classify [illegible] (p.26)」

Saxton, W. T. 1924 Phases of vegetation under monsoon conditions.

Jour. Ecol., 12: 1–38.

Saxton, 1924

p. 15

The conception of the synusia was introduced by Gams in 1918, based on the 'Growth-forms' of Warming and 'Life-forms' of Raunkiaer and other writers. ... Gams, however, seems to have been the first to put the conception into more or less concrete form. ... An aggregation of plants which belong to the same 'life-form' and make similar demands upon a similar habitat [illegible] Gams' conception of a synusia [illegible]

[illegible] perennial [illegible]

[illegible] The [illegible] of vegetation from which we start [illegible]

p. 35: [illegible] observer [illegible] synusia, the vegetation [illegible] which [illegible] and the phases of [illegible] response to a variable habitat [illegible]

[illegible] [illegible]

[illegible] [illegible] p. 34. Without stopping to enumerate such details it is clear that we must [illegible] at least two very different sorts of vegetation, belonging to different [illegible] and having [illegible] to all the external factors, moisture, etc., [illegible] and it is essentially a different habitat.* Undoubtedly it is possible to consider such a complex as a whole, but certainly it must be confessed that until it becomes possible to examine its complexity more [illegible] and [illegible] [illegible] of the [illegible]. The question [illegible] arises whether it would not be better to deal with its components [illegible] (separately), [illegible] of this [illegible].

It seems to the writer that ecology would be made to gain [illegible] by adopting as its fundamental unit something more [illegible] and less [illegible] than the [illegible] complexes generally [illegible] as "associations". The latter are, in fact, associations of [illegible],

* 13 [illegible] Succession & ecology [illegible], ([illegible] [illegible]) [illegible]

* Gams, H. Prinzipienfragen der Vegetationsforschung, Vierteljahrsschrift d. [illegible] [illegible] [illegible]

* original proposion, S.428.

1

Gams 1918 Zusammenfassung.

** original = „aspect [illegible] (S.428)

P.477, VII. Die Einheiten der Vegetation zerfallen in die beiden Gruppen der synökologischen (im engeren Sinn) und der topographischen. Beide sind gleich berechtigt und gleich notwendig, müssen aber scharf auseinandergehalten werden. Sie sind aber vielfach verwechselt und vermengt worden. Dieselben Bezeichnungen, wie besonders „Formation“ und „Assoziation“, sind für so verschiedene Begriffe gebraucht worden, dass diese am besten neu zu benennen sind. Die topographischen Einheiten zerfallen in statische und dynamische, bei den ökologischen ~~i~~ ist eine solche Scheidung nicht durchführbar. Vor dem Missbrauch der dynamischen Einheit ist zu warnen. Die ökologischen Einheiten oder „Synusien*“ werden innerhalb desselben Floren- oder Faunendistrikts durch die vollständige Artenliste charakterisiert, homologe Synusien verschiedener Gebiete (Isöcien) durch ihre Zusammensetzung aus Lebensformen und Aspekten. Die Synusien zerfallen in solche 1. Grades, die aus Individuen einer einzigen selbständigen Art bestehen, solche 2. Grades, die aus mehreren selbständigen Arten von derselben Lebensform** bestehen, und solche 3 Grades, die aus verschiedenen Synusien 1. und 2. Grades bestehen, die aber durch so feste Korrelationen mit einander verbunden ~~ist~~ sind, dass sie eine ökologische Einheit darstellen. Eine topographische Einheit besteht in der Regel aus mehreren durch mehr oder weniger feste Korrelationen verbundenen Synusien und Einzelorganismen („Clans“). Die verschiedenen Schichten der Wälder sind als getrennte Synusien zu betrachten, die nur durch

P.4[illegible]

original S.430

ziemlich schwachen Korrelationen verbunden und daher einer weitgehenden Alternanz fähig sind. Die topographische Einheit oder Biocoenose (bei Alleinberücksichtigung der Pflanzen „Phytocoenose") wird innerhalb desselben Distrikts durch die dominierende Synusie charakterisiert, innerhalb verschiedener oder aller ~~Geb~~ Gebiete als Isocoenose durch die dominierende Isócie. Die Endung -etum soll nur für Synusien 1. bis 2. Grades gebraucht werden.* Die Isócien sind nach den Lebensformen und Aspekten zu benennen. Die Biocoenosen verschiedener Gebiete lassen sich nur unvollkommen homologisieren und werden daher am besten mit Vulgärnamen bezeichnet. Für Isocoenosen sind solche nicht zulässig. Sie sind nach den dominierenden Isocien zu benennen

VIII. Das natürliche System der Synusien ist infolge der mannigfachen die Synusien untereinander verbindenden Affinitäten polyphyletisch und daher nicht anders als in Form eines Bestimmungsschlüssels darstellbar. Die Biocoenosen werden am besten nach den physiographischen Einheiten angeordnet. Ein allgemein verbindliches System lässt sich nicht aufstellen. Die Hauptisocoenosen, auf die sich die Isocoenosen stützen, entsprechen den 15 Klassen selbständiger Lebensformen.

* orignal, S. 461. Fagetum bezeichnet somit nicht einen ganzen Buchenwald, sondern nur die ausschliesslich oder vorwiegend aus Buchen bestehende Waldschicht.

Gams, 1918

* p.441. Seine „Bestandestypen oder Assoziation" sind in erster Linie topographische Einheiten, wenn auch viele Synusien 3° entsprechen.

p.4[illegible] Schröter [illegible] 1902: 'Bestandestypus' oder Association [illegible] type [illegible]!

p.428 Sie ('Synusie') ist lediglich eine griechische Übersetzung von 'Association', die aber kürzer und noch gar nicht missbraucht ist. [illegible] association [illegible] topographical ([illegible] community [illegible]) [illegible] ecological [illegible], [illegible] Gams [illegible] original [illegible]

[illegible] Synusie [illegible] Lianen [illegible] Parasiten [illegible] community [illegible]

p.430 Nicht alle „Biocoenosen" im Sinne von Möbius, Dahl u.a. sind daher Synusien.

p.431. Viele der „communities" Shelfords sind dagegen echte Synusien. Auch die „abhängigen Lebensformen" kann man nur zu Clans vereinigen, will man sie nicht den zugehörigen selbständigen Synusien zuteilen.

[illegible] Synusie 2° [illegible] 3° [illegible] (original. S.431) [illegible] p.432 Synusien, die in ihrer floristischen Zusammensetzung wesentlich abweichen, wird man getrennt behandeln, …. [illegible] p.433: … Unterschiede, die nur einen kleinen Teil der Artenliste betreffen, so wird man innerhalb der Synusie weitere Gruppen ausscheiden. [illegible] Mikroassociation [illegible] !!

Gams, 1918

[illegible] p.434 = Verändert sich irgend einer der direkten Faktoren schrittweise, so geht die Synusie ebenso allmählich in eine nächstverwandte über. [illegible]
Isöcien [illegible] definition (p.434) [illegible]

[illegible] Biocoenose [illegible] Möbius 1877 [illegible] community [illegible]
p.436 Eine Biocoenose umfasst die gesamte auf einem einheitlichen Ausschnitt der Biosphäre (einen Standort, nicht einen Wuchsort!) enthaltene Vegetation im weitesten Sinn. [illegible] (p.437). [illegible] Standort [illegible] topographische Stufe [illegible]

[illegible] Lorenz (1858), Kerner (1863), Hult (1881) [illegible] Gams [illegible] Synusie [illegible] Isöcien [illegible] (p.440)
[illegible] Gams [illegible] Synusia [illegible], Isöcien [illegible] community [illegible]

[illegible] Isöcien [illegible] community [illegible]

Gams 1918

Gams [illegible] Cajander [illegible] Waldtypen [illegible] p. 443. undergrowth [illegible] Baumarten [illegible] Die Bodenvegetation wird durch die Bestand bildende Holzart in ziemlich geringem Grade beeinflusst. [illegible] Cajander will damit nur sagen, dass die Art der dominierenden Bäume ziemlich gleichgiltig ist. Selbstverständlich beeinflussen die Baum- und Strauchschichten die Standortsbedingungen, um so mehr, je stärker sie schatten. [illegible] Samuelsson [illegible] alpine [illegible] geographical (1916) [illegible] undergrowth [illegible] p. 445 Eine gänzliche Entfernung der Waldschicht wirke hier nur unwesentlich auf die Zusammensetzung der Bodenflora ein. [illegible] ~~mag~~ undergrowth [illegible]

[illegible] Gams [illegible] Nach Schröter ist z. B. das Plankton in einem Schilfbestand ein anderes als ausserhalb, was zutrifft; aber andererseits wirkt ein Schoenoplectus-Bestand (Scirpetum) auf das Plankton ~~obwohl~~ ebenso, zur Not auch ein künstliches Pfahlsystem, und andererseits ist es für den Schilf höchst gleichgültig, ~~wo~~ welches Plankton zwischen seinen Halmen lebt.

[illegible]

[illegible] forest [illegible] forest [illegible] 'Korrelationen' [illegible], [illegible] Feld- od. Bodenschicht [illegible] Waldschicht [illegible] Braun, Rasmusson. [illegible] forest [illegible] topographical unit [illegible] ecological unit [illegible] Synusia [illegible] Biocönose [illegible] Hult, Cajander [illegible] Gams [illegible]) [illegible] Braun (...) [illegible] Buchenwald [illegible] Erlen, Weiden, Eschen etc [illegible] Asperula odorata [illegible] Buchen [illegible] Arven [illegible] Buchenwald [illegible] Nicht einmal die Gesamtverbreitung deckt sich mit derjenigen der Buche: so geht Asperula odorata im Wallis weit über die Buchengrenze in das kontinentale Gebiet. [illegible] Als allgemeine Regel gilt, dass alle 'Buchenpflanzen' mit Sommeraspekt auch in gleich stark schattenden Nadelwäldern wachsen, alle 'Buchenpflanzen' mit Frühlingsaspekt auch in andern, natürlich nicht in allen, Laubwäldern. [illegible]

Während einerseits die gleiche Rasensynusie unter verschiedenen Baumsynusien vorkommen kann, sind unter derselben Baumsynusie sehr verschiedene Rasensynusien möglich. [illegible] dichtstehenden Bäumen [illegible] stark schattenden Wäldern [illegible] Vegetation [illegible] forest [illegible] ecological unit [illegible]

Gams 1918

[illegible] p. 4?3 Nach meinen Baobachtungen gibt es sowenig 'baumstete' Rindenmoose wie 'baumstete' autotrophe Blütenpflanzen. [illegible]

p. 4?4 So komme ich zum Schluss, dass auch in geschlossenen Wäldern die Bodenvegetation und die Epixylen gesonderte Synusien bilden, die selbstständige Alternation und auch autonome ~~Sucession~~ Sukzession zeigen und in hohem Masse unabhängig von der Spezies der ~~be~~ beschattenden Bäume sind. Auch die Wiesen wird man in sehr vielen, ~~ob~~ wenn nicht den meisten Fällen, als Biocoenosen und nicht als einfache Synusien 3° ..... Ähnlich bilden die Flach- und Hochmoore mehr topographische als ökologische Einheit. [illegible] Wir müssen vielmehr die einzelnen Synusien der Wälder jede für sich in ihrer Zusammensetzung aus Arten, Lebensformen und Aspekten und in ihrer Verbreitung verfolgen.

[illegible] succession [illegible] dynamic [illegible] Gams [illegible] Clements [illegible] p. 4?7 [illegible] Clements [illegible] organism [illegible] climax [illegible] Clements [illegible] climax formation [illegible] (1916 p. 143) "it must always remain largely a matter of speculation." [illegible] (Gams, p. 4?) [illegible]
We are still far from the final method for delimiting climaxes and their climates. (Clements, 1916, p. 179) [illegible]

Gams 1918

p.460 Es ist kein Zeichen echter Wissenschaftlichkeit, wenn ein Forscher einen eingestandenermassen so unsichern Begriff zur Grundlage seiner ganzen Arbeit macht.

p.457 [illegible] Clements [illegible] Cowles [illegible] Vegetationszonen [illegible] Davis [illegible] physiographischen Zyklus [illegible] peneplain [illegible]

p.458 Auf die Vegetation als ganzes übertragen, führt diese Lehre zu ungerechtfertigen Verallgemeinerungen. [illegible]

p.462 [illegible] Isözien [illegible] Isozönosen [illegible] Synusien [illegible] Hauptisözien [illegible]

p.463 [illegible] Phanerophyten, Chamaephyten [illegible]

[Warming [illegible] formationen [illegible] Phytocoenosen [illegible] Isözien [illegible] Hauptisözien [illegible]]

topographical unit [illegible] phytocoenosen [illegible]

[illegible]

[illegible]

[illegible] ?

[illegible] Gams [illegible] SS.400–466 [illegible] VI. Die Einheiten der Vegetation [illegible]

[redacted]

[redacted] Zur Abtrenzung der Synusien kann, wie schon ausgeführt wurde, nur die ganze Artenliste, als letzter Ausdruck für die Gesamtökologie, dienen. [redacted] Das für die Synusien Ausgeführte gilt natürlich erst recht von den Isözien. Es kann hier noch viel weniger von einem phyletischen System die Rede sein. Es wird wohl stets genügen, wenn man nach den Lebensformenklassen in Hauptisözien einteilt. [redacted] In einem Küstengebiet wird man die Biocoenosen nach Ufergürteln anorden, im Gebirge nach Höhenstufen und innerhalb ~~diesen~~ dieser nach Standorten. [redacted]

Gams 1918

[illegible] System [illegible]
[illegible]
[illegible]

[illegible]
[illegible] Warming (1909) : Standort, [illegible]
Schimper (1898) : Temperatur [illegible]
Graebner (1910) : Nährstoffgehalt [illegible]
[illegible] Drude (1890, 1913). Diels (1908) Brockmann & Rübel (1912) : [illegible]
[illegible] Phytocoenosen [illegible] dominant [illegible]
Isocoen [illegible] Lebensform [illegible] !! [illegible] Darin sind wohl heute alle genannten Forscher einig, dass eine Einteilung nach einzelnen Standortsfaktoren nicht genügt, seien diese nun klimatisch oder edaphisch, dass vielmehr die Lebensformenklassen die Grundlage für das Isocoenosensystem abgeben müssen.

[illegible] Hauptisocoenosen [illegible]
Lebensformenklasse [illegible] 15 [illegible]
[illegible] Lebensformen [illegible] Isocoenosen [illegible]
[illegible]

[illegible] Hochmoor [illegible] Chamaephyten [illegible]
[illegible] Hydro[illegible]phyten [illegible] Isocoenosen [illegible]
dominant [illegible]

[illegible] Gams! March 4, [illegible]

Gleason
1936.

Is the synusia an association?
Ecology 17: 444–451

an originally in Lippmaa, T. 1931. Pflanzensoziologische Betrachtungen. Sitz-Ber. Naturf. Ges. Univ. Tartu, 38:1-32
= [illegible] critique [illegible].

p. 444-5. Every one must agree, however, that there are detached areas of vegetation which differ distinctly from the surrounding vegetation. In many of these the vegetation is composed of distinct layers or strata, differing from each other not only in their species, but also in the environment and in the life-form of the individuals. For a century, the unit group in the study of vegetation has been defined to include all the strata superposed on one area, while the different layers have been considered merely as minor but recognizable members of the unit.

The synusia [illegible] concept [illegible] ~~[illegible]~~ [illegible].

p. 448. Almost without exception, every plant community is composed of two or more layered synusiae which differ, in essence, not ~~not~~ only in the physical environment, but also in the nature of physiological interference of the component plants, and these variations exist both in space and time. Accordingly no such community exhibits absolute spatial or temporal uniformity in its vegetation.

Gleason, H. A.
1936

p. 444 Having extent, it must have boundary and distinct uniformity. both extent and boundary [illegible] are significance. Of these three basic features, uniformity is clearly the most important, since upon it depend both extent and boundary. [illegible] association [illegible]

p. 445 To bring together into one ecological unit all those plants with intersecting spheres of influence leads to a unit which not only possesses uniformity, but is also a dynamic and genetic unit. To bring together into one unit only those plants which have exactly the same environment, namely, those which form a single synusia, leads to the divorce of cause and effect.

[illegible] internal [illegible] balance of nature [illegible] summary [illegible]

p. 451 A synusia is a concrete combinatory vegetational unit, in which the component elements are united by relatively weak genetic and dynamic bonds.

A stand of two or more synusia is a concrete combinatory vegetational unit, in which the component elements are united by relatively strong genetic and dynamic bonds.

The great majority of two-layered stands (i.e. synusia

Gleason 1936

may be explained by temporary suppression, or delayed appearance of other synusias.

As a unit for the development of the vegetation concept of the association, the stand has logical advantages over the synusia. Lippmaa's theory is rejected.

p. 107

original, S. 25.

Ecology 1936 vol. 17, p. 537

A synusia is 'a natural community of species belonging to the same life-form groups and with similar ecological requirements.' (S. A. Cain)

In the ecological description of communities [illegible] [illegible] [illegible] [illegible]. They are no natural units in accord with the degree but not always so, for example, in the epiphytic communities on bark. (Du Rietz [illegible])

[illegible] (Lippmaa), for such [illegible] associations they have, is not meeting with a wide acceptance and was disapproved by the International Botanical Congress, Amsterdam, 1935. A better basis for the arrangement of the [illegible] would be the formation or the most widely used [illegible] groups of species [illegible] and not necessarily in their frequency etc. [illegible]. The arrangement according to formations can be either on a basis of the life-form of the dominant species, treating [illegible] phanerophyte [illegible] as a group, or [illegible] forming groups together the [illegible] in [illegible], microphanerophytic, nanophanerophytic, [illegible], [illegible] etc.

see Cain, S. A.: A plant sociological [illegible] based on synusiae. Ecology 17. [illegible].

Braun-Blanquet, Sociology.

Greason ノ review ニヨル.

○ 彼 Braun-Blanquet ハ life-form ヲ association ヲ特性ヅケルモノニ each form ノ個体数, mass, 被覆度 等ヲ duly ニ与ヘルノデナカッタナラバ, 大シテ重要デナイト考ヘタ. ソシテ Vegetational unit ヲ life-form ノモニ求メルナラバ ソレハ synusia デアリ, ソレノ combination ガ所謂 'formation' デアルトシタ. コノ life-form ヲ重要視シナカッタ点ハ Rübel ノ意見ト相反スル所デアル

○ 彼ハ i.e. floristic composition ニ association i.e. fundamental unit ヲ求メタ. ~~the association ハ~~ i.e. 彼ノ community ノ分類ノ基礎ハ regional, floristic & sociological トイフ三ツニアル. ソシテ genetic & physiognomic ナ方法ヲ排シタ. コノ genetic (Clement) ト floristic ハアル意味デ ground ヲ共ニスルモノト思ハレル (Greason p.72) ナゼナラ physiognomic ト sociological トハ全ク別ノ結果ヲ得ル傾向アリト思ッタノデアル

○ ~~彼ハ~~ physiognomic 又ハ genetic トハ別ニ sociological complexity ニヨッテ彼ハ most simple ナ community (aeroplankton) カラ forest マデノ type ヲ arrange シタ.

○ モトモト association トハ一ツノ concept デアル. ダカラ ソレハ species モ一ツノ concept デアルカラ ソノ similarity トイフ事ニツイテ classification ノ unit ニ対スル exact ナ criteria ヲ求メル事ハ出来ナイ. ナゼナラ species トイフ concept ハ individual ヲ認識ノ対象トシテヰル. ソレハ individualistic i.e. 個体トシテ独立シテヰルノデアル. 又ソノ如キ individual ノ集団ヲ life-form デ分ケタナラバ 'synusia' トナリ formation トナル. ナゼナラ floristic ニモ又見ル場合ハ ソレハ species ノ集団デアル. ソレハ association ノ floristic concept ノ basis トナルモノデアル. ナゼナラ従ッテ若シ association ハ species ニ於ケル individuality ノ如キ個体トシテノ如キ concrete entity トハナラナイ. ソレハ結局化合シテ一ツノ化合物ヲ作ルノ如キモノデハナイノデアル.

○ コノ点 ヨーロッパ学派ハ余リニ concrete ナモノト思ッテ association ノ structure ヲモ二案シスギタ嫌ヒガアルノデアル

(Feb. 8, '37)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Nichols, G. E. 1923 A working basis for the ecological classification of plant communities.

Ecology, 4: 11–23, 154–180.

Nichols

p. 156 [illegible] physiognomical [illegible] identical [illegible] vegetation [illegible] ecological association-type [illegible] Schimper, Clements, Tansley [illegible] formation [illegible]

p. 157 association [illegible] floristic composition [illegible] association [illegible] vegetation unit [illegible] ~~formation~~ association-type [illegible] fundamental importance [illegible] formation [illegible] vegetation [illegible] fundamental unit [illegible]

p. 158 association [illegible] ~~formation~~ association [illegible] species [illegible] genus [illegible] association [illegible] binding [illegible] mesophytic [illegible] beech-sugar maple [illegible] binding [illegible] association [illegible] association-type [illegible] association-type [illegible] association [illegible]

[illegible] association [illegible] vegetation [illegible] association [illegible]

p. 159 association-type [illegible] vegetation [illegible] habitat [illegible] vegetation [illegible]

[illegible] physiognomic or ecological structure [illegible] vegetation [illegible] occupation complex. [illegible]

[illegible] complex [illegible] climatic region [illegible] physiographic [illegible] climates [illegible] vegetation [illegible] climatic [illegible]

2 climatic [illegible]

[illegible] climatic [illegible] all [illegible]

[illegible] From the standpoint of vegetation it is the [illegible] formation is primarily characterized.

[illegible] habitat complex (i.e. habitat complex [illegible])

physiographic [illegible] salt marsh formation [illegible]

The climatic formation in general, is the [illegible] particular climatic formation ordinarily [illegible]

[illegible] In regard to [illegible] or [illegible] conditions [illegible]

[illegible] habitat factor compensation

To take an extreme example, in the humid tropics [illegible] climatic factors [illegible] practically everywhere, regardless of the nature of the [illegible]

[illegible] research, [illegible]

[illegible] physiographic climax (original)

[illegible] coastal plain [illegible]

Gleason, H. A. 1927. Further view on the succession concept.

Ecology 8 : 299-326.

Gleason 1927 pp. 324-325 [illegible]

- succession [illegible] vegetational change [illegible] environmental change [illegible] evolution [illegible] change [illegible] rapid [illegible] slow [illegible]
- succession [illegible]
- [illegible] time-phase [illegible] old [illegible] young [illegible]
- [illegible] succession [illegible]
- [illegible]
- [illegible] individual [illegible] individual [illegible]

Gleason

[illegible] succession [illegible] individualistic [illegible]
association [illegible] individual [illegible]
[illegible] organism [illegible]
[illegible] Gleason, individualistic concept of the plant association, Bull.
Torrey Club, 53: 7-26, 1926 [illegible]
[illegible]

p. 325 Since succession depends on the behavior of the plant individual, since its causes are complex and since each causal factor may act independently of the others at a different rate and in a different direction, a logical classification of seres has not been developed. The usual grouping of seres, and the common correlation of ~~spaci~~ spatial distribution with succession, are of practical value where approximations are sufficient.

Evolution, [illegible]

Cooper, Gleason [illegible] succession [illegible] universal phenomena [illegible] nature [illegible] change [illegible] nature [illegible] evolution [illegible] succession [illegible]

[illegible] succession [illegible] evolution [illegible] universal phenomena [illegible] change [illegible] evolution [illegible] succession [illegible] evolution [illegible] succession [illegible] Cooper [illegible] evolution [illegible]

association [illegible] succession [illegible] community [illegible] community [illegible] community [illegible] successional [illegible] community [illegible]

(Feb 6. 1937)

Smith, V. G. 1928 Animal communities
of the deciduous forest succession.
Ecology, 9: 479-500.

Smith 1928

p.481 **Sere** — a unit succession, comprising the development of an association from initial to climax stage.

Climax — an essentially homogeneous community in equilibrium with the environment in which the component organisms are able to hold their own against invaders.

Presociety — a community of organisms living among the plants of an association and subordinate to the plant dominants. ~~the~~ .... The presociety, as the plant association in which it is located, generally covers an extensive area with an essentially uniform taxonomic composition.

[illegible] association [illegible] composition [illegible] animal community [illegible] plant community [illegible] animal community [illegible] herbivore [illegible]

arctic circle [illegible] antarctic circle [illegible]

[illegible] community [illegible] structural interrelation [illegible]

[illegible] length of activity [illegible] criterion [illegible]

predominant — those constituents which are active throughout the year.

seasonals — those constituents which are inactive during a part of the year.

[illegible] community [illegible]

subinfluent — those constituents which are judged to noticeably affect the community

influent — " " " " obviously important by reason of their abundance, bulk, or range and intensity of activity.

[illegible] mobility [illegible] plant ecology

Smith, 1925

[illegible] 之ニ対応スル言葉ナイ. the dominant ト predominant, subdominant [illegible] ~~seasonals~~ [illegible] seasonally [illegible] influent seasonal [illegible] analogy ヲ主ニシ difference [illegible]」

[illegible] table ヲ見ルニ [illegible] constant ニ [illegible] predominant ト [illegible] influent [illegible] ~~influent~~ [illegible] red oak-maple climax forest ニ於テハ White-footed mouse [illegible] Honey ant [illegible] snail ト springtail [illegible] influent predominant [illegible] structural + meaning [illegible] habitat [illegible]

p. 492 ノ Seral stage ヲ示ス group [illegible] vegetation [illegible]

[illegible] definition ニ [illegible] large mammal ト bird [illegible] all year round ニ collect [illegible] predominant [illegible] (p. 495) [illegible] community structure [illegible] animal community [illegible] seasonal succession [illegible] arthropoda community, insects community [illegible] ~~the~~ community of herbaceous layer [illegible]

Shackleford, M. W. 1929 Animal communities of an Illinois prairie.

Ecology, 10: 126-154.

Shackleford 1929

彼ハ Smith ノ [illegible] (p.132) seasonal [illegible]
[illegible] activity ガ 一年 ノ [illegible] season ニ [illegible]
[illegible] collection [illegible] 一人 [illegible]
predominant ハ [illegible] activity [illegible]
彼ハ [illegible] population ヲ [illegible] Smith [illegible]
次ニ high prairie ト low prairie ノ animal community ヲ predominant
[illegible] 一般 structure of bio-community [illegible]
[illegible] population ヲ [illegible]
又 [illegible] population [illegible]
[illegible]

Shelford, V. E. 1931 Some concepts of bioecology.

Ecology, 12 : 455—467.

Shelford, 1929

[illegible]

Shelford [illegible] rapid stream [illegible]

[illegible]

Shelford, 1931

[illegible]

[illegible]

[illegible] Synecology concept [illegible]

[illegible]

「[illegible]」

[illegible]

「[illegible]」

[illegible]

1 plant community [illegible] association [illegible]

[illegible] species [illegible] ~~[illegible]~~ [illegible]

~~[illegible]~~ [illegible]

2 [illegible] species [illegible]

[illegible]

[illegible] association [illegible] dominant species [illegible]

[illegible]

[illegible] dominant [illegible] community [illegible]

[illegible]

Shelford 1931.

[illegible]

[illegible]

[illegible] Shelford [illegible] 1931 [illegible]

[illegible] association [illegible]

[illegible] formation [illegible] indicate [illegible] dominant vegetation [illegible] p.456 … because the larger and more influent animals tend to range throughout units of largest (formational) size including their seral stages, the biome or biotic formation is the natural ecological unit with some properties which are well illustrated

[illegible] dominant [illegible]

Shelford 1932

by comparison with an organism.

[illegible] deciduous forest [illegible] oak-hickory, oak-chestnut, beech-maple [illegible] associes [illegible]. There is a binding network of dominant plants common to the whole area which is a framework or skeleton. Other species of animals and plants fill in this framework.

[illegible] biome [illegible] red back salamander (Plethodon) [illegible] snail (Gonodiscus) [illegible] animal communities [illegible] p.461 Animals may, because of their motility, find the suitable places in advance of the appearance of the plants. [illegible] p.465 In community migrations, animals precede plants in many cases, due to more rapid migration. [illegible]

[illegible] ?

[illegible] 'fundamental unit of ecology and its characteristics' [illegible] interaction [illegible]

[illegible] plant [illegible] animal [illegible] plant [illegible] animal [illegible] functional [illegible]

[illegible] animal [illegible] plant [illegible] parasitism [illegible]

Shelford, 1931

[illegible] plant [illegible] vegetation [illegible] animal [illegible] food-relation [illegible] plant community [illegible] animal community [illegible] 1931 [illegible] community [illegible] biotic community [illegible] fundamental [illegible] animal community [illegible] plant community [illegible] 1931 [illegible] animal community [illegible] plant community [illegible] interdependence of nature [illegible]

[illegible] Shelford [illegible] biotic formation [illegible] organism [illegible] formation [illegible] influent animal [illegible] dominant plant [illegible]

[illegible] biome [illegible] associated organisms [illegible] (p. 450) [illegible] food relation [illegible] dominance [illegible] formation [illegible]

[illegible] p.461 Plants and animals tend to move together as a unit [illegible] p.462 The natural tendency is for the biome to close in and eventually cover all the area with a community suited to the climate. Sometimes this process is exceedingly slow, however. [illegible] community [illegible] idea [illegible]

Shelford 1931

[illegible] tolerations [illegible] food relations [illegible] fundamental unit of biotic community [illegible] food relation [illegible] ~~[illegible]~~ [illegible] animal community [illegible] p. 464. They live in a given habitat because they find there the complex of environmental conditions required and not alone because they find some particular food plants growing there. [illegible]).

[illegible] higher [illegible] important [illegible] activity [illegible] mammals [illegible] p. 464 Generally speaking, the large groups of animals arranged in the order of their importance in ~~[illegible]~~ land communities are, mammals, birds, insects, lower land vertebrates (chiefly reptiles)

Shelford 1931

Lower invertebrates (chiefly arachnids and annelids). [illegible] p.419 If the bison held some of the mixed prairie in a short grass stage, then short grass is the bioecological climax and its proper bioecological designation is Bouteloua-Bison even though the climax with bison excluded is quite different. [illegible] p.465 In ~~the~~ pristine conditions many large and small animals ranged over the largest plant communities, while others were confined to the ~~various subcommunities~~ [illegible]

[illegible]

p.[illegible] The limiting factors differ in different parts of the periphery of the formation, the one which fluctuates beyond the condition tolerated being the limiting factor.

Shelford, V. E. 1932 Basic principles of the classification of communities and habitats and the use of terms.

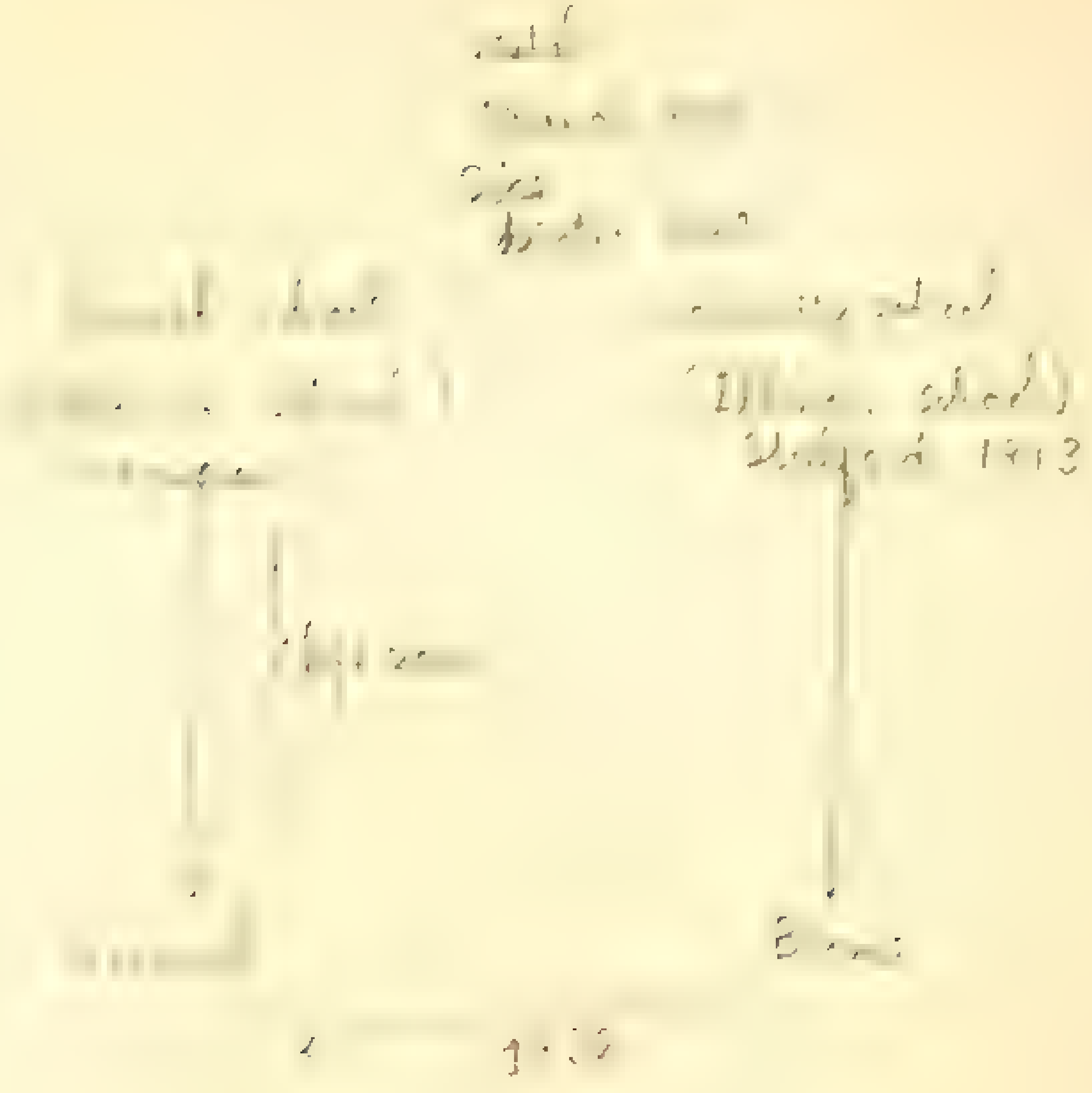
Ecology, 13: 105-120.

[illegible]

Shelford, 1932

[illegible] p. 111 All the smaller communities mentioned in table 1, both developmental and climax, lie within and constitute the biome or biotic formation, and many of the smaller communities lie within the larger ones. [illegible]

[illegible] Climax communities are entirely stable, but still are microcosms and are undergoing change. [illegible]



Shelford 1932

[illegible] larger [illegible] area of the earth's surface, [illegible] taxonomic [illegible] genus, family [illegible] community [illegible] larger unit [illegible] functional [illegible] larger [illegible] of organisms [illegible]

Definition of community

[illegible] community [illegible] p.105 [illegible]: A community includes all the plants and animals of an area [illegible] community [illegible] habitat [illegible] community [illegible] to cover ecological units of every degree (p.117) [illegible] community [illegible] ecological unit [illegible] ecological units [illegible] habitat [illegible] ecological units [illegible] 2 species [illegible] area [illegible] area [illegible] habitat [illegible]

Shelford 1932

[illegible] community [illegible]

[illegible]

dominant species [illegible]

[illegible] large animals [illegible] population [illegible] community [illegible]

Shelford [illegible] population [illegible] quantitative [illegible] dominant species [illegible] community [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. evaluating organisms within communities,
2. recognizing communities on the basis of important ~~dom~~ organisms,
3. evaluating and arranging the smaller and larger communities with reference to each other. The latter must be carried out with reference to the larger [illegible] ([illegible]).

[illegible], 1778

[illegible] In the original communities [illegible], especially, various animal groups [illegible] in the order of their [illegible] first mammals, second birds, third insects and other arthropods, and fourth reptiles and amphibia [illegible]

[illegible]

[illegible] The evaluation of plants does not follow the taxonomic series as closely as that of animals, but is much more closely related to [illegible] and [illegible]

[illegible]

[illegible]

[illegible] the limits of a community are determined by the limits of the dominance and influence of its outstanding species. [illegible]

[illegible] p.117 The dominants of ~~an~~ the association are uniform throughout its extent. A part of a particular association's dominants are found throughout the formation; others are characteristic of the association. [illegible] association [illegible]

[illegible] community [illegible]

[illegible] important [illegible] dominant [illegible]

[illegible] dominant [illegible]

[illegible] outstanding and otherwise important responses which still functioning as [illegible]

[illegible] dominant [illegible] community [illegible]

Shelford, 1932

[illegible] Shelford [illegible] habitat community [illegible] community [illegible] habitat [illegible] habitat [illegible] community [illegible]

[illegible] habitat community [illegible]

[illegible] succession [illegible] habitat [illegible]

[illegible] stream sand dunes [illegible] community [illegible] community [illegible] habitat [illegible] community [illegible] community [illegible] stabilized conditions [illegible] p. 108 In all late stages of community development, the organisms rather than the habitat should always be used. . . . It is best to classify the stages in accord with the climate condition of the community, because it is more uniform over large areas than the substratum. substratum [illegible]

Shelford, 1932

[illegible] The recognition of primary division, of communities or habitats on land and in shallow water on the basis of layers within the community is supported by little or no tenable evidence. The plants of the lower layers of a community are rarely grown without the protection of the taller plants. This is what makes the layers secondary. [illegible] ecological [illegible]

[illegible] society [illegible]

[illegible] p. 110 It is true that many workers from this viewpoint have studied only small subordinate communities and have not considered them in the large natural units to which they belong. [illegible] animal community [illegible] Formation, Association [illegible]

[illegible] p. 112 The process of development and climax constitutes the only basis in natural law and order for the recognition of major community areas [illegible]

Shelford 1932

[illegible] [illegible] !

[illegible] fundamental [illegible] 1910 [illegible] Congress [illegible] This older view, no doubt, grew out of the study of small areas of vegetation left by civilization and with all consideration of animals omitted. [illegible]

[illegible]

p. 14 Ideally, communities may be designated and named according to their [illegible] characters. [illegible]

[illegible] similar [illegible] communities [illegible]

[illegible] ecological [illegible]

[illegible]

[illegible] community [illegible]

[illegible]

[illegible]

Shelford 1932

[illegible] experimental [illegible] From the standpoint of practicability this viewpoint has to be abandoned ... [illegible] ... Such a system accordingly, remains a matter of inference, and the establishment of definite criteria for communities is impracticable. [illegible] ! [illegible] the use of any such system in the study of new communities is quite impracticable. The dominants, predominants, influents and important organisms of communities, otherwise designated or designatable, are the ones whose common physiological characters should be used. [illegible] physiological bases [illegible]

[illegible] Again Nichols' (23) community type is an expression for the similarity of communities which occupy the same conditions but are of totally different taxonomic composition. Here the plant ecologist has always been able to rely upon physiognomy and life form to aid him in selecting comparable types. The animal ecologist left [illegible] without these guides

Bird, R.D. 1930 Biotic communities of the aspen parkland of central Canada.
Ecology, 11:356-442.

1936 / " No.3 [illegible]
~~[illegible]~~
~~[illegible]~~

Bird, 1930

[illegible] naturalist [illegible]
[illegible]

[illegible] natural area [illegible] greater part [illegible] Bird ([illegible]) [illegible]
[illegible] predominant [illegible]
[illegible] predominant [illegible] definition [illegible]

p.360 A general term, predominant, like community, should be used, for those animals of outstanding abundance or conspicuous influence in the community which are present through the year, or entire active or open season, and whose exact importance is not known.
. . . . Thus through their longer period of activity, they are obviously of more importance than forms of equal abundance which are present only for the active period of the community.

[illegible] annual or year round [illegible] active [illegible]
[illegible] outstanding abundance or conspicuous influence [illegible]
[illegible]
[illegible] quantitative [illegible] qualitative
[illegible] characteristic [illegible]

[illegible] 1932 [illegible]
[illegible] ([illegible]) 'formation [illegible]' [illegible]
[illegible]

Bird 1930

[illegible]

p.360 Influents, those are common animals which have important relations in the biotic balance and in the community.

Sub-influents. Those animals which affect the life of the community but which are not as important as the influents.

[illegible]

[illegible] !

[illegible]

Bird, 1930

[illegible]

[illegible] + Shelford [illegible] biotic community [illegible] [illegible] animal and plant associations (communities) are coextensive . If this be true the boundaries of an animal association (community) are those of the plant association (community).

(Bird p.357-[illegible]) [illegible]

p.421 The communities of the aspen parkland are biotic because.

a. Plant and animal communities tend to be coextensive. [illegible]

[illegible]

[illegible] Bird [illegible]

A. G.

Tansley, 1935. The use and abuse of vegetational concepts and terms. Ecology, 16: 284–307.

[illegible]

[illegible]

[illegible] Tansley [illegible] I consider that the concept of succession can be given useful scientific significance only if we can trace in the sequences of vegetation certain uniformities which we can make the subject of investigation, comparison and the foundation of laws. [illegible] … the concept of succession involves not merely change, but the recognition of a sequence of phases subject to ascertainable laws. [illegible]

[illegible]

p.306 Succession is a continuous process of change in vegetation which can be separated into a series of phases. When the dominating factors of change depend directly on the activities of the plants themselves (autogenic factors) the succession is autogenic; when the dominating factors are external to the plants (allogenic factors) it is allogenic. The successions (priseres) which lead from bare substrata to the highest types of vegetation actually present in a climatic region (progressive) are primarily autogenic. Those which lead away from these higher forms of vegetation (retrogressive) are largely allogenic, though both types of factor enter into all successions.

Tansley 1935

[illegible] Sphagnum [illegible] allogenic [illegible] allogenic retrogressive [illegible] Clements [illegible] (p.259)

Tansley [illegible] 1920 [illegible] (plant community) [illegible] plant community [illegible]

[illegible] individual organism [illegible] Tansley [illegible] p.291

We need a word for the peculiarly definite, sharply limited and unique type of organization embodied in the individual animal or plant, and 'organism' is the accepted term. [illegible] p.291 ... the organisation of a mature complex plant association is a very real thing. The relatively stable climax community is a complex whole with more or less definite structure, i.e., inter-relation of parts adjusted to exist in the given habitat and to co-exist with one other.

[illegible]

* p.287 [illegible] I went on to contend, as indeed I had already done in 1920 (pp. 136-7) though without using the terms, that only to autogenic succession can we apply the concept of development of what I called a 'quasi-organism' in climax vegetation [illegible] but that this development ~~[illegible]~~al (or autogenic) succession is the normal typical process in the gradual production of climax vegetation.

Tansley, 1935.

[illegible] vegetational [illegible] Such [illegible] ([illegible])

[illegible]

p.291 It is possible therefore to speak of a 'biocoenosis' only when it react as a whole on the changes of the external and also of the internal factors. [illegible] as a whole [illegible] balance of [illegible] matured ~~[illegible]~~ [illegible] in association [illegible] complex [illegible] stage [illegible] p.291

It is precisely this 'mass action' together with the actions due to the close and often delicate interlocking of the functions of the constituent organisms, which gives coherence to the aggregation, forces us to call it a 'unit,' justifies us in considering it as an organic entity, and makes it reasonable to speak of the development of that entity.

[illegible]

[illegible] development [illegible] quasi-organism [illegible] vegetation succession [illegible]* or favourable unfavourable

[illegible] most favourable soil [illegible]?

because the differentiating factor is a special soil type.

Tansley 1935.

[illegible]

[illegible] p.292 the 'monoclimax' doctrine of Clements and Phillips, which supposes that there is only one 'true' climax in each 'climatic region'; [illegible].

p.292 The usual view is that under the 'typical' climatic conditions of the region and on the most favourable soils the climatic climax is reached by the succession; but that on less favourable soils of special character different kinds of stable vegetation are developed and remain in possession of the ground to all appearance as permanently as the climatic climax. These are called edaphic climaxes. [illegible]

[illegible]

[illegible] Tansley [illegible] climax [illegible] (p.292) [illegible] stable [illegible] p.293 The word climax is used in its simple and natural signification of a culmination of development — a permanent or apparently permanent condition reached when the vegetation is in equilibrium with all the incident factors.

[illegible]

p. 294. Here we encounter a complication which has not hitherto, so far as I know, received any adequate consideration in the literature — I mean the influence of the modern theory of soil development on the theory and classification of vegetation. It is a simple and attractive idea that development of the soil profile runs pari passu with the development of the vegetation it bears, and that consequently the mature climatic soil type corresponds and co-exists with the climatic climax community. It is however quite premature and probably untrue to make any such general assertion.

Tansley 1935

[illegible] Tansley [illegible] equilibrium [illegible]
[illegible] subclimax [illegible] factors climatic [illegible]
[illegible] equilibrium [illegible] factor [illegible]
[illegible] equilibrium [illegible] climax [illegible]
edaphic climax [illegible] Godwin (31) [illegible]
— [illegible] deflected succession [illegible]
Tansley [illegible] climax [illegible]
[illegible] Clements 'subclimax' [illegible] Tansley [illegible]

p. 293 The climatic formation (the formation according to the 'monoclimax theory') is often 'a veritable mosaic' of vegetation (Clements). This of course is quite true. The only question is, how great differences are we to admit as mere variations within the formation? The difficulty disappears of course if we define a formation — a climatic climax — as all permanent vegetation within the climatic region .....

[illegible] Tansley 'climatic region' [illegible] vegetation [illegible]
formation [illegible]
[illegible] vegetation [illegible]
[illegible] life zone [illegible] life form [illegible]

edaphic — climatic — edaphic — vegetation [illegible] correspond [illegible]
co-exist [illegible] Tansley [illegible] p. 294 '... the climatic climax community may establish itself long before the soil is mature, and may not be substantially altered by the later stages of profile maturation.'
[illegible] steep slope [illegible] immature [illegible]

[illegible] polyclimax [illegible] climax [illegible]
climatic climax [illegible]
(June, 25, [illegible])

[illegible] Tansley [illegible] Exactly the same is true of vegetation determined by any other edaphic factor, e.g., permanent waterlogging for part at least of the year, or high soil acidity due to the poverty of the subsoil in basic ions or to the high rate of leaching in a highly permeable soil — which checks the maturation of the soil or diverts its course and thus prevents the appearance of climatic climax communities. [illegible]. There is no evidence that such kinds of vegetation represent stages of seres which will lead to climatic climax, nor can they be naturally regarded as parts of that climax. (p. 295)

[illegible]

[illegible] polyclimax [illegible]
[illegible]

Tansley 1935

[illegible] composition [illegible] normal climatic mature profile [illegible] soil [illegible] climax vegetation [illegible] different life form [illegible] dominant [illegible] same climatic region [illegible] climatic climax [illegible] part [illegible] phase [illegible] (p. 295). [illegible] vegetation [illegible] phase [illegible] prea [illegible]

[illegible] immature topography [illegible] vegetation [illegible]

p. 295 But this is surely to assert that tectonic and vegetational development must always run pari passu, whereas their time factors are usually widely different. They are very far from always keeping step, and immature topography is actually often clothed with climax vegetation.

[illegible] Tansley [illegible] p. 306 [illegible] conclusion [illegible] A climax is a relatively stable phase reached by successional change. Change may still be proceeding within a climax, but if it is too slow to appreciate or ~~two~~ too small to affect the general nature of the vegetation, the apparently stable phase must still be called a climax. The highest types of vegetation characteristic of a climatic region and limited only ~~only other factors~~ by climate ~~from the~~ form the climatic climax. Other climaxes may be determined by other factors such as certain soil types, grazing animals, fire and the like. [illegible] still is called a climax [illegible]

Tansley 1935

Complex organism (by Phillips)

Biotic community. Biome (by Clements & Shelford)

[illegible] complex organism [illegible] biotic community [illegible] [illegible] Tansley (p. 296) [illegible] biotic community [illegible] community [illegible] society [illegible] p. 296 A 'community', I think it will be generally agreed, implies members, and it seems to me that to lump animals and plants together as members of a community is to put on an equal footing things which in their whole nature and behaviour are too different. Animals and plants are not common members of anything except the organic world. [illegible] potato [illegible] trees [illegible] community [illegible] member [illegible] [illegible] identity [illegible] similarity [illegible] fungi [illegible] [illegible] member [illegible] potato plant [illegible] human community [illegible] member [illegible] human parasites [illegible] societies [illegible] parasite [illegible] community [illegible] member [illegible] community [illegible] society [illegible]

[illegible] parasite [illegible] community [illegible] member [illegible] parasite [illegible] community [illegible] member [illegible] parasitic phanerogams [illegible] community [illegible] member [illegible] community [illegible] community [illegible] community [illegible] gap [illegible]

Tansley 1935

member

[illegible] (p. 296) [illegible] similarity [illegible] society [illegible] human society [illegible] human [illegible] dominant [illegible] community [illegible] society [illegible] parasitic member [illegible] community [illegible] potato plant [illegible] member [illegible]」

[illegible] (p. 296) For these reason also, the practical ~~necessar~~ necessity in field work of separating and independently studying the animals communities of a 'biome', and for some purposes the necessity of regarding them as external factors acting on the plant community — I cannot accept the concept of the biotic community. [illegible] plant community [illegible] animal community [illegible] biotic community [illegible] 'biome' [illegible]

biome

[illegible] biome [illegible] p. 297 'biomes the whole webs of life adjusted to particular complexes of environmental factors, are real 'wholes, often highly integrated wholes, which are the living nuclei of systems in the sense of the physicist.* [illegible] ecosystem [illegible] organism [illegible] biotic community [illegible] wholes [illegible] biome [illegible]

!!

* [illegible] p. 306. The whole complex of organisms present in an ecological unit may be called the biome. [illegible] ecological unit [illegible]

Tansley, 1935

p.299 In a certain sense however, the community as a whole may be said to be the 'cause' of its own activities, because it represents the aggregation of components the sum (or more properly the synthesis) of whose actions we call the activities of community — actions which would not be what they are unless the components were associated in the way in which they are associated. ··· But it is important to remember that these activities of the community are in analysis nothing but the synthesised actions of the components in association. We have simply shifted our point of view and are ~~comp~~ contemplating a new entity, so that we now, quite properly, regard the totality of actions as the activity of a higher unit.

[redacted] !

p.306 The fundamental concept appropriate to the biome considered together with all the effective inorganic factors of its environment is the ecosystem, ···· In an

Tansley, 1935

ecosystem the organisms and the inorganic factors alike are components which are in relatively stable dynamic equilibrium. Succession and development are instances of the universal processes towards the creation of such equilibrated systems. [illegible] p. 299 [illegible] Though the organisms may claim our primary interest, when we are trying to think fundamentally we cannot separate them from their special environment, with which they form one physical system. [illegible] These ecosystems, as we may call them, are of the most various kinds and sizes They form one category of the multitudinous physical systems of the universe, which range from the universe as a whole down to the atom. [illegible] isolate [illegible] solar system [illegible] individual organism [illegible] p.300 Actually the systems we isolate mentally are not only included as parts of larger ones, but they also overlap, interlock and interact with ~~each other~~ one another. [illegible] p.300 They all show organization, which is the inevitable result of the interaction and consequent mutual ajustment of their components. [illegible] ~~The more~~ .. There is in fact a kind of natural selection .. . those which can attain the most stable equilibrium survive the longest. ... . The more relatively separate and autonomous the system, the more highly integrated it is, and the greater the stability of its dynamic equilibrium. [illegible]

Δ [illegible] great regional climatic complexes of the world are [illegible] determinants of the primary terrestrial ecosystems, [illegible] contribute parts (components) to the systems, just as to the soils and the organisms.

ΔΔ pp. 300 301. "Owing to the much greater local variation of subsoil and physiography than of climate, and to the fact [illegible] some of the existing variants prevent the climatic factors from playing the full part of which they are capable, the developing soil complex, jointly with climate, may determine variants of the biome. … Hence we must recognise ecosystems differentiated by soil complexes, subordinate to those primarily determined by climate, but none the less real.

Tansley, 1935

[illegible]

[illegible] Δ p.300 In fact the climatic complex has more effect on the organisms and on the soil of an ecosystem than these have on the climatic complex, but the reciprocal action is not wholly absent [illegible]

[illegible] ΔΔ [illegible]

[illegible] p.301 The primary importance of vegetation is what we should expect when we consider the complete dependence, direct or indirect, of animals upon plants. This fact cannot be altered or gainsaid, however loud the trumpets of the 'biotic community' are blown. [illegible]

[illegible]

Tansley 1935

Biotic factors

[illegible] p.303 Forest may be converted into grassland by grazing animals. The substitution of the one type of vegetation for the other involves destruction of course, but not merely destruction: it also involves the appearance and gradual establishment of new vegetation. It is a successional process culminating in a climax under the influence of the actual combination of factors present and since this climax is a well-defined entity it is also the development of that entity. [illegible] grazing animal [illegible] equilibrium [illegible] vegetation [illegible]

[illegible] Bison-Buffalo [illegible] climax [illegible] biotic climax [illegible] moving climax [illegible] (p.292)

[illegible] factor [illegible] vegetation [illegible] equilibrium [illegible] subclimax [illegible] climax [illegible] climax [illegible] climax [illegible] climax [illegible] autogenic succession [illegible] climax [illegible] climax [illegible] physiographic climax [illegible] edaphic climax [illegible]

Phillips
↑ p.226

Tansley, 1935

[illegible] 一番 ~~[illegible]~~ edaphic [illegible] highest ナ form ガ [illegible]. [illegible] climatic climax トシ, [illegible] standard [illegible] R [illegible] succession [illegible] law [illegible]. [illegible] climax [illegible] succession ノ law [illegible]. [illegible] 人工 [illegible] secondary [illegible] Bison ト sheep [illegible] primary [illegible] secondary [illegible] succession [illegible] dynamic [illegible] [illegible] Phillips [illegible]

(Tansley [illegible] p.303)

[illegible] ecosystem [illegible] balance of nature [illegible] primary [illegible] nature ノ balance [illegible] man-made nature [illegible] equilibrium [illegible], Tansley [illegible] climax [illegible] succession [illegible]. primary ト rule [illegible] ecologist [illegible] 人文[illegible], 経済学, 社会学 [illegible]

[illegible] Clements ヤ Phillips ノ organism theory [illegible] false [illegible] biotic community [illegible] biome [illegible] ecosystem [illegible]

Phillips, J. 1934. Succession, development, the climax and the complex organism: an analysis of concepts. Part I.

Jour. Ecol. 22: 554–571.

" 1935.

Part II. Development and the climax.

Jour. Ecol. 23: 210–246.

" 1935.

Part III. The complex organism: conclusions.

Jour. Ecol. 23: 488–508.

Phillips, 1935

p. 242 Warming and Graebner (1933, p 400), however, in their last work, were still definitely of the opinion that the dynamic, genetic basis of the study of plant communities could not be used as a basis for a systematic classification. Gams (1918), and Saxton (1922, 1924) believe that the synusia is preferable to the association (in the sense of the English school of ecologists): this I find difficult to understand in the light of the fundamental nature of the climax.

vegetation fundamental unit [illegible] climax [illegible] climax): [illegible]

[illegible] vegetation [illegible] individual [illegible] vegetation [illegible] community [illegible] same species [illegible] vegetation [illegible]
(Phillips [illegible])

[illegible]

Phillips, 1935

Biotic community [illegible] plant [illegible] interrelation [illegible] integrated community [illegible] concept [illegible] historical development (p.501)

first suggestion by Clements (1905) `Research methods in ecology.'

second by Vestal (1913) `Local distribution of grasshoppers'

; single biotic association [illegible]

Clements (1916) Bull. Ecol. Soc. Amer., [illegible] biotic formation or `biome' [illegible] concept [illegible]

Clements (1916) `Plant Succession' [illegible]

Shelford [illegible] independently [illegible] conclusion [illegible] plant ecology [illegible]

[illegible] Watt [illegible] biotic community [illegible]

Phillips [illegible] definition.

p.504 The biotic community is an organism: a highly complex one; this concept is fundamental to a natural setting and classification of the profoundly important process of succession, development, and attaining of dynamic equilibrium.

Yapp, R.H. 1925 The inter-relations of plants in vegetation, and the concept of association.

Festschrift Carl Schröter, Geobot. Inst. Rübel, 3 : 684–706.

!! Priority

Yapp 1925

[illegible]

- [illegible]
- dependence [illegible] different [illegible]
- mutualism [illegible]

[illegible]

[illegible] stratum [illegible] Licht [illegible] Boden [illegible]

[illegible] evolution [illegible] stabilization [illegible]

[illegible]

フレーズ high pitched or low pitched ノ [illegible]

[illegible]

[illegible]」

[illegible]

[illegible]」

今西 1937. [illegible]–330

山岳 [illegible] —

~~[illegible]~~ —

association [illegible] p [illegible] – 295

[illegible] p [illegible] – [illegible]

[illegible] p 117 — [illegible]

ゴヨウマツ → ゴヨフマツ

Clements, 1936

p. 253 climax [illegible] Hult 1885 = [illegible] suggest [illegible]

" According to this view, the climax constitutes the major unit of vegetation and as such forms the basis for the natural classification of plants communities. The relation between climate and climax is considered to be the paramount one, ...

254 At the outset it was recognized that animals must also be considered members of the climax, and the word biome was proposed for the purpose of laying stress upon the mutual roles of plant and animals (Clements, 1936b; Clements and Shelford, 1936).

...... the term climax has more and more to replace the word formation, which is regarded as an exact ~~system~~ synonym, and this process may have been favored by a tendency to avoid confusion with the geological ~~[illegible]~~ use. ..... Furthermore, climax and biome are complete synonyms when the biotic community is to be indicated, though climax will necessarily continue to be employed for the matrix when plants alone are considered.

[illegible] Clements [illegible] Shelford [illegible]

[illegible] formation = climax = [illegible]

[illegible] climax [illegible] delimitation [illegible]

Clements, 1936 [illegible] uniformity [illegible]

[illegible]

Clements [illegible] of the climax [illegible]

[illegible]

Clements 1936

p. 55 The visible unity of the climax is due primarily to the life-form of the dominants, which is the concrete expression of the climate. . . . . Hence, the essential unity of a climax is to be sought in its dominant species, since these embody not only the life-form and the genus, but also denote in themselves a definite relation to the climate. [illegible]

p. 56 [illegible] several million years [illegible] climax [illegible]

[illegible] climax [illegible] dominant [illegible] succession [illegible] permanent [illegible] prairie + desert [illegible]

[illegible] dominant [illegible] [illegible]

Clements, 1936

[illegible] It is not supposed that they embrace all the units finally necessary for a complete system, but their constant application to the great climaxes of North America for nearly two decades indicates that they meet present needs in the matter of analysis. [illegible] category [illegible]

[illegible]

* p.277 [illegible]

Clement 1936

[illegible] clay [illegible] sociation [illegible] (p.278) [illegible] prairie [illegible] investigator [illegible] generalization [illegible]

[illegible] Climax [illegible]

[illegible] Proclimax of sagebrush, a disclimax due to overgrazing of mixed prairie [illegible] a proclimax [illegible] Artemisia [illegible] sagebrush [illegible] proclimax [illegible] disclimax [illegible] proclimax [illegible]

[illegible] ..there is but one kind of climax, namely, that controlled by climate. [illegible] balance [illegible] climax [illegible] (Tansley) [illegible] climate [illegible] monoclimax [illegible] organism theory [illegible] p.261

.. the strong support brought to them by the rise of emergent evolution and holism (Phillips, 1935), the characterization of the climax as given in 'Plant Succession', in 1916, still appears to be both complete and accurate. [illegible] 'The unit of vegetation, the climax formation, is an organic entity' [illegible] p.261 It is the climax community of a succession that terminates in the highest life-form possible in the climate concerned.

Clements 1936

[illegible]

proclimax

[illegible]

subclimax

[illegible] p. 242. Chaparral proper is to be regarded as a climax [illegible]

[illegible] 'serclimax' [illegible] (p. 264) [illegible] In boreal and subalpine districts the distinctive serclimax is the peat-bog, moor or muskeag, more or less regularly associated with other seral communities of Carex and usually of Larix or Picea also in the proper region.

* also p. [illegible] ** [illegible]

Clements 1936

disclimax

[illegible]

[illegible]

[illegible] With the exception of the two extremes, arctalpine and tropical, each climax has a dual role, being preclimax to the contiguous community of socalled higher life-form and postclimax to that of lower life-form. This may be illustrated by the woodland climax, which is postclimax to grassland and preclimax to montane forest. [illegible]

!! [illegible]

The arctic and alpine tundras exhibit only the preclimax relation, to boreal and subalpine forest respectively, ... [illegible]

Clements 1936

[illegible] 267: However, in our present imperfect knowledge of causal factors it is simpler and more definite to determine rank by position in the cliseral sequence, each community higher in altitude or latitude being successively preclimax to the preceding one. [illegible]

preclimax.

[illegible] parkland [illegible] preclimax, [illegible] p. 268 Within the same formation, the more xeric associations or consociations are preclimax to the less xeric ones. [illegible] association [illegible] orographical climax [illegible] climax [illegible] subclimax, preclimax [illegible]

postclimax.

~~[illegible]~~ [illegible] Clements [illegible] (p. 269) [illegible] desiccation [illegible] postclimax [illegible] flood-plain [illegible] sand-hill [illegible] postclimax [illegible] vegetation [illegible] postclimax [illegible]

[illegible] preclimax [illegible] True climax [illegible] p. 278 It has also been customary to employ seral terms ~~of~~ for preclimax and ~~proclimo~~ postclimax, and this appears to be the better usage for disclimax and proclimaxes in general.

Clements 1936

p. 281 ecotone: applied to the meeting of dominants between two units

mictium: applied to the mixed community that intervenes between two seral stages or associations.

p. 282 panclimax, comprising the two or more related climaxes or formations of the same general climatic relation, the same life form and common genera of dominants.

Raunkiaer, C. 1934. The Life Forms of Plants and Statistical Plant Geography, being the collected papers of C. Raunkiaer, translated into English by H. Gilbert-Carter, [illegible] and Miss Tansley.
[illegible], with [illegible] figures and [illegible].
Oxford [illegible], [illegible]

Raunkiaer /

p. [illegible]

[illegible] unfavorable climate = adapt. [illegible] life form [illegible]; Cryptophyte [illegible] Geophyte & Therophyte [illegible]

p.139 June Isotherm 10° と Chamaephyte [illegible] 20% [illegible] correspondence [illegible] boreal zone [illegible] boundary [illegible] Arctic Waldgrenze [illegible] July Isotherm [illegible] 10° と correspond [illegible]
[illegible] an exact numerically expressed basis for characterizing and demarcating plant climates, even the most distant regions and [illegible] different [illegible]
[illegible] Waldgrenze [illegible] correspondence [illegible]

p.140 ○ Fagus silvatica / upper boundary [illegible] 10% chamaephyte
Pinus montana [illegible] 20%
} [illegible]

2 Scandinavia [illegible] Spruce と Birch [illegible] limit [illegible] 10% chamaephyte [illegible]

p.203 I have shown that those regions whose climate is the same as far as vegetation is concerned show essentially the same biological spectrum.

p.204 Formations are in general characterised by their dominant species

p.212 The theory of formations, on the other hand, concerns itself with the grouping of the individual species of the flora in a given substratum.

p.216 Formations have no sharp boundaries.

p.218 At any rate for the time being, we must use the habitat, the environment, as the starting point of our investigations on the formation.

p. [illegible]9 Formation [illegible] deciduous meso-megaphanerophyte formation [illegible] Beechwood [illegible]
Hemicryptophyte formation [illegible] ground flora [illegible] well-lighted wood [illegible]
Geophyte formation [illegible] ground flora of the beechwood [illegible]

[illegible]

[illegible]

[illegible]

[illegible] tarpots [illegible] of the [illegible] vessel are

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] series

[illegible] →

[illegible] →

[illegible] →

[illegible]

p. 143. Further I have shown that in the Northern Hemisphere, travelling from the southern boundary of the Hemicryptophyte climate to the Polar lands, we pass a series of biological zones bounded by Bio-chores; and if in the same region we ascend from the foot of a sufficiently high mountain we pass ~~region~~ through a corresponding series of zones characterised in exactly the same way, there being as many altitudinal zones as we find zones between the mountain's position and the Pole. Here we have the proof that the series of spectra, which express the distribution in life-forms of the individual species of the floras, may be used as an expression of the ~~soil~~ plant climate, since they change in a definite way in correspondence with change in the climate, but remain unaltered in the same climate, even if the species composition of the floras be entirely different.

p. 421 As a ~~[illegible]~~ consequence, the spectra of formations have two important points of view, the biological and the physiognomic: biologically, the formation is characterised by the life form which numerically predominates, that is to say ~~to~~ by its frequency, physiognomically, by the form which dominates by its mass.

p. 519 There scarcely exist two species with exactly the same range of habitat with exactly the same distribution; and species vary widely in the abundance with which they occur.

p. 520 The regions within which the species occur as a frequency-dominant are scarcely the same for any two species still less for more.

p. 610 Such a varied and composite thing as for instance the [illegible] tropical rain forest or the deciduous wood of the Hemicryptophyte climate area cannot be made the direct subject of a scientific investigation, it must first be resolved into its individual components, the more narrowly delimited formations, and these latter are the real subject of the doctrine of formations.

Association ト Formation

Typenlehre ト Formenlehre トニ於ケル
觀点ノ相違ニツイテ.

(第二講座第三十七回談話会ニ於ケル発表)

Dec. 4 1936.

life form トイフコトガ最近ニ到ッテ我ガ国ノ ecologist ノ間ニ屡々噂サレル様ニナリ、殊ニ~~植物~~ plant ecologist ノ間ニ於テヨリ animal ecologist ノ間ニモ、ソレガ学界ノ話題ニ上ルヨウニナッタノデ、コノ life form ノ theory ノ創始者デアル Raunkiaer ノ~~[illegible]~~論文集。

C. Raunkiaer: The life form of plants and statistical plant geography. ~~1935~~. 1934.

ヲ主題ニシテ、少シ話シテ見ヨウト思ッタノデアリマス。尤モ私ガ之ヲ読ミマシタノハ life form トイフコトガ最近評判ニナッタカラトイフノデハナクテ、私自身ノ仕事ガ之ニ関係ヲ持ツ様ニナッタカラデアリマシテ、従ッテコレデオ話シシマスコトモ、実ハコノ Raunkiaer ノ theory ノ学説ヲ紹介スルトイフモノデハナクシテ、之ト対照シテ、私ノ考ヘテ居マス formation トイフ~~[illegible]~~ニツイテコノ機会ニ発表~~[illegible]~~ヲ試ミマシテ方法ノ御批評ヲ仰ギタイト思ッタノデアリマス。ソレデ私ハ彼ノ説ト私ノ考ヘトヲ出来ルダケ clear ニ別ケテオ話シスルツモリデハ居リマスガ、意見ノ相違スル点ハハッキリシマシテモ、ソウデナイ点モ話ノ中ニハ出テクルダロウト思ヒマスカラ、ソノ点ハ予メ、私ノ意見ヲイッテ居ルノカ、彼ノ意見ヲイッテ居ルノカヨク御聞キ別ケ頂キマシタ上デ、御注意御批判ナリ御質問ナリヲ賜リタイト思ヒマス。」

私ハ先ヅ synecology ノ発達史トイフ様ナコトカラ~~[illegible]~~話ヲ展開サセテ行キタイト思フノデアリマス。トイフノハコノ synecology ノ発達ノ歴史ヲ知ルコトガトリモ直サズ又 Raunkiaer ノ功績ヲ評価スルニ最モ正当ナ立場ヲ与ヘルモノデアロウト信ジルカラデアリマス。植物学方面デ Warming, Cowles, Clements トイフ様ナ人達ガ現レテ今日ノ plant synecology ノ基礎ヲ築キマシタノニ対シ、動物学方面デハ之ニ追随シテ今日ノ animal synecology ノ基礎ヲ確立シタノガ Adams ト Shelford デアッタノハ既ニ御承知ノ通リデアリマス。而シテ Shelford ノ Animal communities in temperate America ハ 1913 ニ発表サレタモノデ、実ニ既ニ20年モ前ノ過去ニ属スルモノデアル、ソレニモ拘ラズ、今日~~[illegible]~~コノ方面ニ於ケル研究ガ果シテ Shelford ノ時代カラドレ程

ソノ内容ニ於イテ進歩シテヰルダラウカ。ソノ standard ガ ~~[illegible]~~ Shelford ノ時代カラ今日マデノ20年間ニ於イテ ~~[illegible]~~ 大 ~~[illegible]~~ ニ進歩シタ。ト ~~[illegible]~~ 断言出来ル人ガアルダラウカヲ私ハ疑フノデアル。~~[illegible]~~ 私ノ答ハ大シテ ~~[illegible]~~ 進歩ガナカッタト答ヘル他ナイノデアル。然ラバ何故進歩シナカッタノデアラウカ。私ハ(ソコニ)~~[illegible]~~ ソノ start ニ於イテ ~~[illegible]~~ plant synecology ノ影響ニ ~~depend~~ 依存シ (ソシテ今日ニ至ルマデ plant synecology カラ抜ケ出シテヰナイ) animal synecology ハ ソノ20年間ニ於イテ 云ハバ plant synecology ノヨリ大ナル進歩ヲ実ハ期待シテ待ッテヰタ形ニアッタト考ヘラレル。~~[illegible]~~ トイフコトハ、ソノ20年間ニ plant synecology 自体ガ大シテ進歩シナカッタトイフコトニナルノデアル。~~[illegible]~~ ソレデハ実際 plant synecology ハソノ内容ニ於イテ進歩ガナカッタカ。私ハソノ ~~[illegible]~~ 同時代ノ[illegible] ト比較スレバ (相当) ソウ云ッテモ過言デハナイト信ズル。然ラバ何故 10年ハ plant synecology ガ 進歩シナカッタカトイフニ ~~[illegible]~~ ~~[illegible]~~ 断言スルノデアル。~~[illegible]~~ ソノ20年間 ~~[illegible]~~ トイフモノハ 私ノ考ヘルトコロニヨレバ synecologist ガ community ノ unit ヲ探索スルノニ浪費シテヰタカラデアルト思フノデアル。ソレハ丁度動物地理学者ガ boundary line ノ探索ニ時間ヲ浪費シタノト同ジ様ニ。実際ニ認識 ~~[illegible]~~ シ得ル形ニ於イテ実在シナイモノヲ。恰モ実在スルモノノ如ク考ヘテ追求シタカラ 模索デアッタトイフノデアリ。又 ~~[illegible]~~ ソレ故 時間ノ浪費デアッタト ~~[illegible]~~ 私ハ極言 ~~[illegible]~~ スルノデアル」

デハ plant community ノ fundamental unit トイフモノヲ 抽象 ~~[illegible]~~ 的ニ若シクハ 具体 ~~[illegible]~~ 的ニ plant synecologist ハドウ ~~[illegible]~~ ナルモノトシテ之ヲ把握シテ来タデアラウカ。1910年ノ Brussel ノ Congress デキメラレタ definition デハ '~~[illegible]~~ association' ~~[illegible]~~ トイフモノガ fundamental unit of synecology トナッテヰテ。ソノ内容ハ以下ノ如クニ、'An association is a plant community of definite floristic composition, presenting a uniform physiognomy, and growing in uniform habitat condition' トイフノデアル。i.e. association ノ認識ノタメニハ 1) floristic composition, 2) physiognomy, 3) habitat. ノ三ツノ要素ノアラハス意味ガハッキリトシテヰナケレバナラナイ。~~[illegible]~~ デアルカラ。ヨッテコノ順ニ」

~~2) [illegible] 3) [illegible] ニツイテ[illegible]~~

omit (i.e. 厳密ニイフナラ同ジ floristic compositionヲモツタ二ツノ地域ハ存在シナイトマデ云ッテヨイノデアル.)

ソレデハassociationヲ規定スル三ツノ條件ノ一ツ一ツニ就テ少シ考ヘテミタイノデアリマス。~~[illegible]~~ ~~[illegible]~~ ソレデ果シテ associationトイフモノガ実際ニ如何ナルモノカ。之ヲ ecological ニ見テ plant synecologist ノ多大ノ労力ニ値スルダケノ價値アルモノカトイフ様ナコトニ対スル答ヲ得タイト思フノデアル。先ヅ第一ノ floristic compositionトイフコトデアルガ community 研究トイフモノハ 植生上, community ニ ~~決シテ一定ノ~~ floristic composition ヲ持ツテ, i.e. ソレニイフ associationトイフ様ナモノニ clear ニ分析シ得ルモノデハナイ。

オイテハ floristic compositionトイフモノハ実ハ homogeneous ノ [illegible] ニ変化スルモノデアル

omit (ソノ二種類ノ植物ノ タトヘテモ ソノ分布ノ形式ガ合致シテヰルトイフコトハ一般ニ望メナイカラデアル。)

ソコデ definite floristic compositionトイフ意味ヲ dominant species ニ関シ definite ナ floristic compositionトイフ風ニ ~~[illegible]~~ 解スルコトニヨツテ スコシダケ 実際ニ [illegible] ノ [illegible] 適用ヲ見出シテ ~~[illegible]~~. 次ニ physiognomyトイフノハ何デアルカトイフニ plant community ノ physiognomy トハ ソノ community ノ ~~general outward appear~~ 相貌, 外貌トイフベキモノデアッテ 我々ガ deciduous forest, トカ meadowトカ, i.e. 森林, 草原 ナドトイフ言葉デ vegetation ヲ表現スルトキニハ ソノ physiognomy ニヨツテヰルノデアル。從テ ~~[illegible]~~ ソノ physiognomy ナルモノハ, ソノ community ヲ構成シテヰル植物ノ中ノアル prominent ナ植物ノ life form ニヨツテ決定サレテヰルノデアル。ダカラ physiognomyトイフモノハ floristic composition ニ直接ナ関係ヲモタナイ。例ヘバ森林トイヘバ其ノ中ニ生エル shrub ヤ herb マデハ問題ニセズトモ, 之ヲ構成シテヰル ~~characteristic ナ~~ 植物ノ中デ physio~~graphic~~gnomically ニ dominant ナ喬木トイフ一ツノ life form ~~[illegible]~~ ノ集合体ヲ認識スレバイイトイフコトニナルワケデアル。コノコトハ特ニ[illegible]説明スル必要モナイト思フ。~~[illegible]~~ 次ニモ一ツ残ニ残ッタ habitat 或ヒハ habitat condition トイフコト。~~[illegible]~~ ~~[illegible]~~ ニ就テ論ズル必要ガアリマスガ, ~~[illegible] 実例ヲ 呈出シテイナイト思ヒマス~~

[illegible]

以上ノ様ナコトデ plant community ノ fundamental unit ハ ~~association~~ デアルト define サレテモ, サテ実際ニ如何ナルモノガ association トシテ認識サレテヰルカトイフ点ニ至ルト, 欧州ノ学者ノ間デモ ソノ見解ガ実ニマチマチデ ~~[illegible]~~ 一致シタ ~~[illegible]~~ 点ガ見出サレテヰナイ。ソレデハ

p.4

([illegible])
~~[illegible]~~ ト云フノデ. ~~plant community ノ研究トシテハ~~ I.P.E. ノ1923年ノ meeting デヨーロッパノ Buchwald ノ共同研究ガ呈出サレ. 各国ノ plant synecologist ガ夫々自国ノブナ森林ヲ研究シ, ソノ結果ヲ総合シタモノヲ チューリッヒ[illegible]ノ Rübel ガ編輯シテ出シタノガ 'Die Buchenwälder Europas' (1932) デアリマシテ. 各論ノ中ニハ Buchenwald ヲ研究スル場合ニ如何ニ気ヲツケルトイフ課題ガ含マレテヰル デアル. ソシテコノ ~~[illegible]~~ 研究ノ主題トナツテヰル Buchenwald トハ何デアロウカ. 'ブナノ単純林' ハ必ズシモブナノ森林デアル. シカモブナガ単純林ヲナスノハブナノ分布地域ノアル部分ダケデアル. 即チ垂直分布ノ状態ヲ見ルト, ブナ林ノ下位ニハ Picea excelsa ノ森林ガ接シ, ソノ下位ニハ Eichenmischwald i.e. Quercus, Carpinus, Castanea 等カラ構成サレル森林ガ続ク. ソシテ各論ノ接続ハ単純林カラ単純林ニ移ルノデナクテ, ブナノ単純林カラ混淆林トナリ, ソノ中ニ含マレルブナノ個体ガ減ツテユク. 遂ニブナヲ含マナイ他ノ community ニ移ルトイフ経過ヲトル場合ガ多イノデ, 一様ニ移ルノデハナイノデアル. Clements ニヨレバ コウイフ移リヲ 'ecotone' トイフテ[illegible]ノ[illegible]ヲ[illegible]ニ[illegible]ナイ. 人ニヨツテハ又コノ現象ヲ Fagus ノ association カラ Fagus-Picea ノ association ヲヘテ更ニ Picea ノ association ニウツルトイフ風ニ見ルノデアル. [illegible] コノ Fagus-Picea ノ association トイフモノハ初メニ Fagus ガ多ク, 次ニ Picea ガ多クナル[illegible]. i.e. [illegible] ~~[illegible]~~ 単ニ floristic ニ同一デアツテモ ソノ内容ニ於テハ homogeneous ナモノデハナイ. ダカラ先ヅコウイフ移リ変リノ途中ニアルモノデナク, 換言スレバブナノ単純林ヲトリ出シテ[illegible]ガ見テモ[illegible] Buchenwald トシテ研究ノ対象ニ出来ル. i.e. コウイフモノヲ[illegible] Typical ナ Buchenwald ~~[illegible]~~.. [illegible] コノ process ニ於テ[illegible]分類学ガ一ツノ Typenlehre ニナツテユク傾向ヲ示シテヰルノデアリマス」

サテノ如クニシテ選ビ出サレタ森林ハブナガ dominant デアルト共ニ[illegible] definite floristic composition ヲ持ツ. 又 physiognomy トシテ見テモ uniform デアル. ソレヲ 'Fagetum silvaticae' ト記シ, 之ヲ一ツノ association ト認メル. ~~[illegible] community [illegible]~~
ソウイフ見方ヲスル人ガ非常ニ多イノデアル.
ココニイフ人ト[illegible]ノデアリマス.

↗ i.e. association トハモット小サイモノダト考ヘル人ガアルガ（画期的ニ）

又ワガ同ジブナノ純林デアッテモ，（ソノ中ニハ）ブナノ生育状況ノヨイ林モアレバ悪イ林モアル．ソシテコレハソノ habitat condition ガ違フカラデアッテ区別シテモヨイモノデアロウト考ヘル．ソレナラモシブナノ林内ニ入ッテ観察シテ見ル．スルト同ジブナノ純林デアッテモ，ソレゾレニ其ノ undergrowth ノ種類ガ必ズシモ同一デナイ．コレハ気候ハ habitat condition，殊ニ Boden ノ相違ガ，カラダ undergrowth ノ相違ヲ来シテヰルモノダロウト考ヘル．又実際ソウイフ場合ガ観察サレル．スルト association トハ其ノ undergrowth 中 dominant i.e. subdominant species マデ含メナケレバナラヌ結論ニナリ又ソウ定義シナケレバナラヌト考ヘル人ガ出テクル．ソシテコノ考ヘヲ forestry ニ応用シタノガ Cajander ノ Waldtyp ノ theory デアッテ，undergrowth ノ種類ニヨッテ森林ノ生長度，従ッテソノ土地ノ利用価値ヲ判断シヨウトイフノデアル．ヨッテコレデモ又其ノ ~~undergrowth~~ ノ sub dominant species ニ因テ分レ方モ同ジ．更ニイッタラ同ジ様ナ事ガ書ケル．ハテ決定セネバナラヌ subdominant ノ更ニ subdominant ヲ求メテモ，i.e. イクラ分析シテイッテモ式ガ残ッテ居ルダケデ尽キナイコトデアル i.e. ソレデ我々ハ一ツノ個体ニマデ分析シテユカネバナラナクナル，或ヒハ遂ニ community 群落ヲ対象トシテ考ヘル限リニ於イテハ community 相互ニハ boundary ガナイ事ヲ認メナケレバナラヌ．然シ association ダケハ矢張リ一ツノ community ナノデアルカラ，association ハ明ラカナ boundary ハナイ．i.e. ~~association トハ我々ノ認識デアル~~ 由ッテソノ boundary ノナイトイフコトハ i.e. association ソノモノニハ我々ノ認識ニ付ヘル様ナ形 Form ガナイトイフコトナノデアル．

〇 Rübel ガ実ニ使ッテイル例ヲ挙ゲテ見ル結果，Buchenwald（ソレハ）~~habitat condition ナ異ニシ floristic composition ヲ異ニシ undergrowth ヲ含ム~~ association ヲ一段高イ 'Assoziationsverband' (Braun-Blanquet) トカ Föderation (Du Rietz) トカイフモノ（ノ結合シタモノトシテ）認メ，ソノ中ニイクツカノ association ヲ区別シタガ，ソノ association 中デモ特ニブナ林トシテ typical ナモノ i.e. Haupttyp トシテ認メタモノガ ブナトクルマバソウ Asperula odorata トノ association i.e. Fagetum asperulosum デ，何モ association ノ Form ヲ認メタノデハナクテ，community ノ中カラ Type トシテカウノ如キモノヲ選ンダニスギナイノデアル．ダカラ其ノ Begleitflora ノ代表トシテ Asperula ハ

ハ分布地域ヲブナノ分布地域ト合致セシメテ居ルモノ ~~[illegible]~~ デナケレバナラナイナドトイフコトハ ヲ association ノ concept ノ中ニハ含マレテ居ナイノデアル。又事実 Asperula ハ ブナトハ independent ニ、他ノ typical ナ ブナノ Begleitflora トトモニ ~~Ficht~~ Picea ノ針林中ニ見出サレテ居ル場合モアル。又ブナノ分布限界外ノ Poland ~~ノ Asperula~~ ヤ Wien ノ東方デハ Asperula ハ Quercus ヤ Carpinus ノ Mischwald ノ中ニモ見出サレテ居ルノデアル。i.e. 此レ等ノコトヲ綜合スレバ association ハ plant community ~~[illegible]~~ カラ抽象ニ選ビ出サレタ一ツノ type デアル。"カカル Type ニヨッテ plant community ガ clear ニ区域的ニ分類サレルモノデハナイ。~~[illegible]~~ 又 plant community ノ unit ト認メルハ勝手デアルガ、カカル type ヲ選ビ出ス学者ノ眼ハ曖昧デアル。「ヨーロッパノ flora ノ事情 林ハ単純デアルカラ association ガ一ツノ森林ノ林木ト、又ハ ~~[illegible]~~ undergrowth 中ノ dominant 種トデ規定サレルガ、ソコデカ floristic ニ複雑ナ tropical ノ森林ヘココノ方法ヲ持ッテイッテバドーナルダロウカ。~~[illegible]~~ 究ニ ~~[illegible]~~ 中欧ヨリモ北欧ノ森林ニ於イテモ、dominant ト 森林樹種ノ数ハ相当ニ多イノデアル。ソレラ引ッ回ッテモ樹木 ~~[illegible]~~ ナテハ community ノ分類ガヨーロッパ流ニイテハ研究 ~~[illegible]~~ ガアヘ デアル 内地デハ ~~undergrowth [illegible] floristic~~ [illegible] デアル。ソシテカクノ如キ場合欧州デ認メラレタ type ト同ジ association ト到ッテ同ジ [illegible] association トガ、果シテ ecologically ニ同一性質ノモノデアルカドーカハ実ニ非常ニ疑問トスベキ大ナル問題デアルモノナノデアル。~~[illegible]~~ 比較ノ ~~[illegible]~~ fundamental ナ根拠ガ言ヘラレナイノニモ拘ラズ ~~[illegible] community unit ヲ [illegible]~~ （シテ association ヲ基ニシテ） 分析サレテ居ナイ様ナ fundamental ナ unit ~~[illegible]~~ ヲモッテイルノ様ナ気ニナッテ、community ノ分析ニ没頭シテ来タ。ソレガ私ノ云ッタ様ニ ココ20年間近ク plant synecology ガ此ノ世界ニ於イテ [illegible] 進歩サレナイト云ッテアリマス。

思ウニ ~~vegetation ノ fundamental unit ニ [illegible]~~ ソシテノ plant syne [illegible] ~~[illegible]~~ association ヲ vegetation ノ fundamental unit ト見做シテ来タカ ニ協ツテ [illegible] ヘガ不ラナカッタカラトイフコトニ 例ヘバ Cooper ノ様ナ人ガ居ナイデアロウ, Cooper ハ association ガ

Floristic composition ヲ基トシタ
(May. 18. 1945 稿)

マデハ 'formation' ヲ fundamental unit ト考ヘラレテヰタ。此ノ formation トイフ言葉ハ Grisebach ガ初メテ用ヒタモノデアッテ、彼ノ definition ハ 'a group of plants, such as a meadow or a forest, that has a definite physiognomic character' トイフノデアル。之ニ対シテ 1910年ノ Brussel ノ会議デ採ッタ definition ニヨルト 'It is composed of associations which differ in their floristic composition but are in agreement, firstly with the conditions of the habitat and secondly as regards growth form' ~~[illegible]~~ トナッテヰルノデアリマス。コレナドノ def. ニヨルナラバ formation トハ association ヨリ更ニ一段高イ分類ノ単位デアリ 例ヘバ association ヲ分類ノ fundamental unit トシテノ species ニ例ヘルナラバ formation ハ genus ニ相当スルモノデアルト考ヘラレ、又実際ソウイフ風ニ formation ト association トノ関係ヲ取扱ッテヰル人ハ少ナクナイノデアル。シカシコレデ依然トシテ問題トナルノハ 此ノ定義ニ grow form トイフ言葉ヲ使ッテヰルコトデアル。コレニイフ所ノ growth form トハ life form ト同意義ニ解スルコトガ出来ルノデアルトシテ ソシテコレニ賛成スルナラバ formation トハ必ズシモ association ニ結バレタ群落ノ分類学的ナ単位トシテノミノ存在デハナク life form ヲ基準トシ、physiognomy ヲ対象トスルコトニヨッテ floristic composition ニ無関係ナ一ツノ別ナ体系ガ成立スルノデナケレバナラヌトイフ考ヘ方ニ導カレ得ルノデナイデアラウカ。又コレハ Warming ニ始マリ Raunkiaer ニヨッテ完成サレタ vegetation ノ一ツノ別ナ classification ~~ノ存在ヲ認メ~~ ナケレバナラヌノデアリマス。即チ コノ二ツハモトヨリイフノハ、一方ノ floristic composition ヲ重要視スル人達ハ、ソノ多クガソノ結果ニ於イテ、physiognomically ニハ殆ンド区別出来ナイヨウナ所謂 'microassociation' 迄等ニマデ分ケルニ至ッタ。即チ floristic composition ニヨッテ physiognomy ヲ犠牲ニシタ傾向ノアルニ対シ、他方ハ physiognomy ニヨッテ floristic composition ヲ犠牲ニシタトイフ事ガ出来ヨウ。此ノ点ハ学的ニ見テ非常ニ重要ナ問題デ ~~[illegible]~~ アルト云ハネバナラヌノデアリマス。ソシテ前者ノ主張スル所ハ ~~formation~~ 成程 association ガ species ナラバ formation ハ genus ニ当ルデアラウ。ナレドモ此ノ unit ト考ヘラレル association ハ厳格ナ意味ニ於イテ決シテ species ニ当ルモノデハナイ。此ノ species トイフモノモ要スルニ一ツノ type デアルコトヲ知ラネバナラヌガ ソレハ生物ノ個体トイフモノニ立脚シテヰル限リ、ソノ根源ノ対象トシテ生物ノ個体ノ form トイフモノガ basis ニナッテヰルノデアル。シカシコレニハソノ Taxonomy ~~[illegible]~~ ノ basis ガアルノデアル。然ルニ之ニ中ニ

上ゲタ様ニ community ノ unit ト考ヘラレタ association ニハ form ガナイ。然ラバコノ立場カラ考ヘルナラバ formation ニモ又 form ハ考ヘラレナイ。ソレハ只ダ type トイフ丈ケノモノデハナイ筈デアル。ソレニモ拘ラズ ~~formation~~ physiognomy ニ主眼スルナラ；ソレハ個々ノ生物ノ形態ノ認識ヲ根據トシテ、一ツノ直接經驗出来ル具体的事実ナノデアルガ私ハ主体ニ form ヲ認メテイルモノト考ヘル。ダカラコノ立場カラ申セバ formation ト association トノ間ニハ何等ノ分類学的ツナガリハナイノデアル。~~[illegible] floristic [illegible]~~ トシテハガ又 Griesebach ニ於テ formation ノ本来ノ意義ナノデアル。ダカラ floristic ナ立場ニ立ツ人ハ association ノ上位ニ於ケル分類的単位ノ名称トシテ formation トイフ言葉ヲ用ヒズニ、之ニ挙ゲタ様ニ 'associationsverband' トイフ様ナ言葉ヲ以ッテ之ヲ表現シタ方ガ ~~clear~~ 混乱ヲサケ得ラレテイイト考ヘルノデアリマス。ソレデ私ノコレカラ先使用シマス formation トイフ言葉ハ、~~[illegible]~~ 意足 associationsverband トハ同意義デナイ。physiognomy ニ立脚シタモノデアルコトヲ含ミ頂キタイト思ヒマス。ソレデ生態学的ナ研究立場ニ引イテ ~~[illegible] association ナドノ~~ vegetation 若クハ plant community ヲ見ルトキ、私ハ勿論 association ヲステ、コノ formation ヲ fundamental basis ニトラウトスルモノデアリマス。ソレハ今申シタ様ニ physiognomy トイフモノハ種ノ個体形態ニ立脚シタ一ツノ具体的事実デアル。ソレデコソハッキリ一ツノ生物現象トシテ之トソノ環境トノ比較研究ガ出来ル可能トナルノデアル。i.e. physiognomy ハソノ意味デ私ノイフ実在的ナ。~~[illegible]~~ 社会形態トシテノ種ヲソノ中ニ認メルコトニナルノデアル。ダカラソレハ一ツノ system トシテノ存在現象ヲ示ヘタモノデアルトイフコトニナ~~[illegible]~~ルダロウト思フノデアリマス」

ソレデコノ physiognomy ~~[illegible]~~ 決定ノ基礎トナル life form トイフコトガ問題トナリ。甞テ Raunkiaer ガ言ハレタノデアリマスガ、彼ノ life form ノ分類ニツイテハモウ少シ[illegible]見エマスカラ紹介ヲ略シマス。只ダココニ御注意頂キタイハ彼ノ life form ノ分類ノ根拠トナッタノガ、ソノ土地ニオイテ最モ環境條件ノ悪イ season ニオイテ、ソノ植物ガ越冬芽ヲ地表ニ対シ如何ナル位置ニ存在セシメテ居ルカトイフ点ニアッタトイフコトデアル。ダカラ全ジ多年生草本デアッテモ、越冬芽ガ地表ニアルカ、或ハ地中ニアルカニヨッテ彼ハ Hemicryptophyte ト Geophyte トニ二ツノ form ヲ区別シタノデアル。[illegible]ニデス。最モ環境條件ノ悪イ season トイヘバ我ガ国ナラバ冬デアル。冬ニハ草本ノ殆ド全部ハ枯レテ了フノデアル。ダカラ Hemicryptophyte デアロウガ

コノニツ[illegible]

Geophyte デアロウガ ~~[illegible]~~ ニカヽハルナラバ 宿主芽ガ地表ニアロウガ地中ニアロウガ 実ハ physiognomy ニ対シテハ何等直接ノ関係ガナイノデアル。~~又寒[illegible]的條件ノヨイ熱帯ニ行ッテ、多年生草本ガ全テ木[illegible]ナッテ居ルガ、[illegible] コレラノ植物ハ 皆一種シテ皆 Phanerophyte i.e. 地上植物群ニ入ッテシマフノデアル。然シ physiognomy [illegible]~~ 寧ロ physiognomy トイフ立場カラ申スナラバ ソレハ環境條件ノ悪イ season ヲ持ツタコトナレバナラナイノデナイカト考ヘラレル丈デ彼ノ分類ハ困ルト。気候的條件ガヨイ熱帯ニ於イテ、多年性草本ガ全テモ木化シテシマフコトニナルト、コレラノ植物ハ 皆一種シテ Phanerophyte i.e. 地上植物群ニ入ッテシマフコトニナルノデアル。然シ physiognomy トイフ立場カラ申セバ 彼ノ分類ニヨッタコトモ 今迄カラノ様ニ喬木林、潅木林、矮潅木林、多年生草本群、一年生草本群 ナドトイフ方ガ、ヨリ明瞭ナ表現デナカロウカト考ヘラレルノデアリマス。尤モ Raunkiaer ノイフ如ク、最モ condition ノ悪イ season ニソノ植物ガ適応シテ居ルノデナイナラバ（カツ）、ソノ植物ハソノ地ニ生存出来ナイノハ明カデアル。∴ ソノ土地ノ気候ト ソノ土地ノ植物ノ形态的適応トイフ点ニ於イテ、彼ノ分類ハ確カニ ~~mer~~ アル ecological ナ meaning ヲ持ッテ居ルノヲ認メル。サレド 之ヲ忘レルコトダケガ 決シテ ソノ植物ノソノ地ニ生存ニ係ル唯一ノ必要條件デハナイノデアル。冬ヲ無事ニ行ツテモ 同氏ガナッテモ、ソコデ更ニ周囲ノ competition ニ勝ツモノデナケレバ ソノ地ニ於イテ dominancy ヲ得ラレナイ~~ution~~コトハ明カデアル。~~[illegible]~~ コノ点ハ彼ノ係ル theory ニ未完デアリ過ギルノデアリマシテ、ツマリ Phanerophyte ヨリモ Hemicryptophyte、~~more than~~ ノ方ガック bad condition ニ於イテハ イツテモ ヨリ進化シタモノデアリ。従ッテ cold temperate ニ於イテハ Hemicryptophyte ノ数ノ方ガ ハルカニ Phanerophyte ヨリ dominant デアルトイフ。事実 堀川、佐藤両氏ノ paper ヲ見マスト 我ラ北地デハ Hemicryptophyte ガ数量ニ於イテ dominant デアル。~~[illegible]~~ ソレハ確カニ一ツノ事実デハアルガ、コレヲ以テヨシトイツテ 我ラ国ノ vegetation ハ physiognomy ニ於イテモ又 Hemicryptophyte ガ dominant ナ physiognomy ヲアラハシテ居ルトイフコトニ ~~[illegible]~~ 我之ノ眼ノ前ニオカレテモハ 決シテソウデハナイ。我ラ国ノ気候下ニ於イテハ 森林ガ ~~domin~~ dominant ナ physiognomy ヲ呈スルデアロウコトハ、少クトモ climax formation ニ於イテ ソウナラウコトハ 誰レモ疑ハナイ所デアロウト思ヒマス。i.e. ココニ一ツノ食ヒ違ヒガ生ジテ居ルト思フ。コノ食ヒ違ヒハ然ラバ何処カラ来テ居ルカトイフニ、彼 Raunkiaer ハ成ル程 life form トイフモノニヨツテ

floristic ニ違ッタ二地方ノ vegetation ヲ比較スル事ハ成功シナイデアラウガ, ソノ data トナルモノ. 例ヘバ彼ノ spectrum ノ材料ヲ何ニ求メテ来タカトイフニ, ソレハ主トシテ其ノ地ノ floristic composition ニ依ル~~モノナラ~~ナカッタノデアリマス. 次デ physiognomy ニ於イテ dominant ヲ見ルトイフ事ハ必ズシモ floristic composition ニヨルモノデナイ. 植物ハ [illegible] 従来一致ノ傾向デアッテモ一面ニ見ナケレバナラナイ. ~~floristic~~ ソノ於イテ来ル要素ハ floristic デハナクテ biotic ナモノデアルトイフコトヲ我々ハ此ニ強調シタイノデアリマシテ. ソレハ先ニ申シタ様ニ competition トイフモノニ帰著スル. ~~[illegible] life form ヲ見スル [illegible] competition [illegible]~~. ダカラ一年生草本カラ多年性草本ヘ, 更ニ多年性草本カラ灌木, 喬木トイフ順序デ succession ガ行ハレルモノト考ヘ. ソシテ climax formation トイフモノガ, ~~[illegible] climax formation [illegible]~~ vegetation ヲハカル一ツノ standard デアルト考ヘルナラバ, ソレハ climax formation ニアラハレタ physiognomy トハ結局ソノ地ノ気候, 土壌, 生物間ノ competition 等ニ由ル綜体ノ結果ノ summation デアリ, ソレ故ソレハ一番ノ stablized condition デアルト解セラレルコトトナルノデ~~[illegible]~~, アルト思ハレル, ソシテヨリ fundamental ナ principle ヲ基ト考ヘルナラバ, synecology トシテハモウ取リアゲル価値ガ非常ニ少クナルモノデアル~~[illegible]~~ト. イフテイヽンヂャウト考ヘマス」

此ニ於イテ life form ニ関シテ多少疑ヒヲ抱クノハ従来ノ floristic geography ニ対シテハ彼ガ一ツノ新タ考ヘ方モシニ来ナイ. ソノ意味デ彼ノ spectrum ノ application ヲ~~[illegible]~~思ハレル程ノモノデアル. ケレド彼ガ意味スル plant climate トイフモノニ対シテハ ソノ~~[illegible]~~性質ノ区別デアラウガ [illegible] ヲ得ナイ. 先ニモ申シタ様ニ我ガ国ナドハ Hemicryptophyte ガ normal spectrum ニ対シテ著シク高率ヲ示ス. ダカラ我ガ国ナドノ気候ヲ Hemicryptophyte climate デアルトイフ事ハ, 一ツノ事実ノ説明ニ依テ言葉ヲ置キ換ヘタニ過ギナイノデアル. 一ツノ事実ト他ノ事実トノ ecological relation ヲ表シテ居ルノデハナイ. ソノ上 spectrum デ 40% 以下ノ Phanerophyte ヲ示ス地ヲ総テ Hemicryptophyte climate デアルトイフ [illegible] 分ケ方ハ, 表現ガ numerical デアルニモ exact ナ objective ナ [illegible] ヲ失ヘルニ於テモ, 全ク~~[illegible]~~主観的ナモノニ他ナラナイ. モーツツッコンデ云フナラバ, 先ニモ云ッタ様ニ彼ノ spectrum ノ

材料トナッテキルモノガ或地域ノ flora ナノデアル。~~a floristic list~~ ハ flora ノ specific name ノ代リニ彼ハ（彼ノ）life form ~~[illegible]~~ ヲ（指示符号之）置キ換ヘタノデアル。ダカラモトモト群落ノ floristic composition トイフ立場ニ立ッテキルノデアルカラ。ソコニ ~~regions~~ アル場所カラ他ノ場所ヘ群落ガ continuous ナ移リ行キヲ示スモノデアルコト。floristic composition モ亦之ニ従フベキデアリ。従ッテ之ニ ~~[illegible]~~ 如シタ彼ノ spectrum モ[illegible]決シテソノ中カラ definite ナ限界ヲ見出シ得ナイコトハ当然ノ帰結デアルト思ハレル。是ハマサシクレル方法ノ一ツノ Typenlehre デアル。群落ノ分類モ其ヲ同ジクスルモノデアル。然シ ecology ヘ合法デハナイノデアラウ。彼ノ spectrum ハ plant climate ハ（floristic ナ[illegible]傾向ヲ現ハスニ過ギ[illegible]）~~[illegible]~~ マダ ecological geography 又ハ synecology ~~ノ上ニ主要ナ[illegible]~~ ノ要求スル様ナ dynamic ナ ~~[illegible]~~ ~~statistic [illegible] Raunkiaer~~ 基礎ニ立ツモノデハナイト云ハレテ居ルノデハアルマイカ」

Raunkiaer モコノ点ニ深ク気ヅイテキタト見エテ、彼ハソノ後ニ於イテ life form ノ応用ノ範囲ヲ拡張シ、一ツノ plant community ヲ単ニ ~~spec~~ floristic composition ニヨッテ spectrum デ表現（スルコトニ満足セズシテ）~~[illegible]~~、ソノ community 内ニ於ケル同種類ノ number ヲ考慮スル様ニナッタ。ソレヲ彼ハ percentage frequency ト云ッタ。ソノ種ノ ~~[illegible]~~（アル）調査区数中ニ於ケル出現頻度デアラハス様ニシタノデアル。ソシテコノ出現頻度百率トイフモノニ対シテ（彼ノ）life form ヲ apply シタ。例ヘバ Hemicryptophyte ニ属スル種類ガ a 種アッテ、ソノ頻度率ノ total ガ b デアルトスレバ、コノ b ヲ以ッテソノ community 内ニ於ケル Hemicryptophyte ノ valency ヲ現ハサウトイフノデアル。ソシテコノ方ガ確カニ単ナル ~~floristic~~ species（no.）ノ numerical treatment ヨリモヨリ synecological ニ近イデモアリ、コノ事実ノ表現ニ近イモノトイフコトニナルガ、併シカクノ如キ valency ガ果シテ妥当デアルカドウカトイフ点ニ疑問ガアル。~~quadrat ノ大キサニモ関係シテ居ル~~ 私ハコノ方法ヲ直チニ ~~[illegible]~~ 實地ニ採用スル（ベキ）~~[illegible]~~ 理論的根拠ガマダ不充分デアルヤウニ思フノデアリマス」

~~[illegible] valency [illegible]~~ 思フニ彼ノ plant climate ノ分類トイヒ、又コノ percentage frequency ト life form トノ combination ニヨル community ノ表現法トイヒ、何レモ我々ニ[illegible]シテ参考ニ足ル所ガアルノデアルトイヘバ、例ヘバ高層ニ於イテ或ハ種

熱帯デハ phanerophyte ノ種ガ多ク. 温帯デハ Hemicryptophyte ニ属スル種類ガ多ク. 寒帯デハ Chamaephyte ニ属スルモノガ多イトイフコトヲ表現シタノハ 確カニ彼ノナシタ一ツノ merit デハアルケレドモ. ソレハ一ツノ方向ノ相違ヲアラハシタモノデアッテ. ソレガ直チニ價値ノ相違ヲアラハシテヰルモノデハナカッタカラデアリマス. ソレデ私達ニアッテハ. 彼ハコノ價値ヲ附与シヨウト試ミタノデアルケレドモ, ソレガ少シモ成功シタモノト云ヘナイ理由ハ. コノ價値ガ一ツノ community ヲ対象トシテ之ノ頻度率ヲトッテヰル事ニ表現ニ得ラレテヰナイカラデアル. 例ヘバコヽニ1本ノ木ガアッテ ソノ林冠ノ下ニ60本ノ ~~Chama~~ Hemicryptophyte ニ属スル植物ト 40本ノ Geophyte ニ属スル植物トガアッタトスル. スルト彼ノ表現ニヨルナラバ 1P, 60H, 40G トナル. シカシソノ結果カラ直チニ Hemicryptophyte ガ dominant デアルトスルワケニハ行カナイノデアル. ムシロ一定ノ種ニ対シテ1本ノ木ガ100本ノ草本トガ与ヘテヰル為ニ1本ノ木ト1本ノ草トデハ ソノ valency ハ 100:1 デアルトイフ風ニ解シナケレバナラヌ. 故ニ life form ニ基ヅク physiognomy ヲ認識ノ対象ニオクコトハ, 私トシテハ life form ニ引ケル高サノ相違 i.e. stratum トイフコトヲ度外視シタ ~~valency ヲ表現シタモノデアッテ~~. モシソノ木ノ高サガ草ノ高サノ30倍アルトスルナラバ ~~100×30:1 = 3000:1 トイフコトニナリ i.e.~~ ソノ場合ノ stratum ノ valency ハ i.e. 30:1 デアル. ∴ 一本ノ木ト一本ノ草トノ関係ハ 3000:1 デアルトイフ風ニデモシナケレバ 実ニ ecological ナ評價ハ出来テヰナイト思フノデアル. ソコデ Raunkiaer 自身ハ コノ点ヲドウ切リ抜ケタカトイフニ. 彼ハ逆ニ formation トイフモノヲ ~~stratum~~ sub stratum ニ属スルモノト解スルニ至ッタノデアル. i.e. 彼ハ ~~physiognomy ヲ~~ stratum トイフモノヲ結局彼ノ life form トハ別ニ認メテヰタ. ソシテ全ジ stratum ニ於イテ彼ノ theory ヲ適用シタノデアル. i.e. 上ニアゲタ例ナラバ H ト G トハ全ジ stratum ヲ形成スル ソシテソノ stratum ニ於イテ H ノ方ガ G ヨリ dominant デアルトイフコトハ, 之ハ云ヒ得ルワケデアルカラデアル. 尤モ 彼ノ云フ formation トイフノハ 実ハ microassociation ニ他ナラナイノデハアルガ. 故ニ association ニ於 formation ニシロ, ソレヲ stratum ニ属スルモノト限定シタコトハ, 例ヘソレガ発鏡ノ一案デアッタモノト知ラヌガ. ナットモ非常ニ大胆ナ 思ヒツキ今迄ノ研究者ノ誰モガ考ヘテヰナカッタ

ソテニハ idea ヲ書イテ [illegible]
森林中ニ [illegible]
formation ハ climax [illegible]

p.13

ヨウナ見解ジャナイカト思ッテヰルノデアル。ソシテ私ハ今迄従ッテ来タ Raunkiaer ノ仕事
ヲ~~[illegible]~~世間デ噂シテヰル程ニ高ク評価シナイトイフコトニナルノデハナイカト思ッテヰルノデアリマスガ
ソノ気ヲ~~[illegible]~~ヅケテ呉レタノハ彼ニ案ヘシテ了ッタノデアリマス。ソシテ彼ノ stratum 論ニ従ッテ Phanerophyte
formation トカ Hemicryptophyte formation トカイフモノハ。実ニ Nichols ノイフ様ナ
~~ecological~~ community ノ ecological structure ヲアラハスモノデアルト考ヘルノデアリマス。i.e.
physiognomy トハモトモト一ツノ dominant ナ stratum ヲ認メテヰルノデアル。ソレナラ森林トイヘバ
ソノ undergrowth トシテノ shrub ヤ herb ガ実ハ同様デナカッタノデアル。~~[illegible]~~ Physiognomy 若クハ stratum
トイフノハ結局種ノ一ツノ社会形态ヲ認メ~~[illegible]~~。或ヒハ life form トイフ点ニ於テ equivalent
ナ種カラナル一ツノ社会群ノ形态ヲ認メテヰタモノ~~[illegible]~~ニ他ナラナカッタ筈デアル。ダカラソレハ
対象トシテ既ニ群落カラ分析サレタモノデアッテ、決シテ群落ソノマヽノモノデナイトイフコトニナルノデアルト思~~[illegible]~~
フノデアリマス。ダカラ例ヘバ高山ニ於イテ森林ハソノ気候的森林限界線ヲ越エテ~~[illegible]~~ハイマツナドノ形
成スル灌木林ニツヾキ、ソレガ更ニ草原ニ移ッテ~~[illegible]~~ソレラガ life form ニヨッテ規定サレタ一ツノ
formation ノ系列デアリ、ソレハ又~~[illegible]~~群落ノ性格ヲ表ハスモノ一ツノ ecological structure ニ他ナ
ラナイト考ヘルノデアル。ソシテソノ様ナ系列ハ水ニ対シテ、或ヒハ海洋ニ対シテモ~~[illegible]~~見ラレルモノデアラウ。
又~~[illegible]~~カラノ同様系列ニ於イテハ群落ハ形态ヲ異ヘタモノトシテ認識サレルノデアル。ソレナラ association
~~[illegible]~~ヲ対象トスレバ Typenlehre ニナルケレドモ formation ヲ対象トスレバソレハ formenlehre ニナルト私ハ
結局云ハザルヲ得ナイ。~~[illegible]~~ 又例ヘバ
climax forest ノ中ニ入ッテソノ carpet ~~[illegible]~~ヲナシテヰル様ナ ground flora ヲ~~stratum~~認メル時、我々ハソコニモハッキリト formation、i.e. ecological
structure ヲ認メル。ソレハ取リモナホサズ示スモノデアッテ実ニ definite ナ discontinuous ナ二ツノ~~[illegible]~~社会群ノ
存在ヲ証スルモノニ他ナラナイ。コノ点ハ既ニ British 学派ノ authority Tansley ハ初メハ Raunkiaer
ノ学説ヲ見直シタト書イテヰルノデアリマス。ドウ見直シタトハ此処ニ書イテナイケレドモ。彼ノ得タモノガ果シテ何
デアルカハ私ニハワカラナイ~~[illegible]~~。此処ニ Raunkiaer ~~[illegible]~~ノ研究~~[illegible]~~ハ少クトモコノ
今迄ヨリモ更ニ~~[illegible]~~現象ヲ今一度見直サレルベキモノデ~~[illegible]~~ ソシテ formation ヲ此ニ彼ノ群落ヘ
ノ見方ヲ [illegible] 植物社会ノ相互関係ガ新シイ synecology ノ研究対象トナッテクルノデナカラウカ。~~[illegible]~~ 彼ハ
~~[illegible]~~ ~~研究ハ提案ヲ書ヒタイ~~ノデアリマス。(Dec. 3, 1936)
気候ヲコノ意味デハ20年前ノ以前ノ業績ヲ再ビ [illegible] ~~[illegible]~~ synecology ノモノデアッタト思ヒタイノデアリマス。

今日ハコノ前ノ話ノ續キヲシタイト思ヒマス. 前回ニ於イテハ余リ多クニヤヤ雑スギタタメ却ッテ意味ノトリ難イ所ヲ生ジ 又一方私ガ甚ダ不適當デアッタコトト思ッテ. 今日ハ約一時間位トシテ ~~[illegible]~~ 殘リハ次回ニマワスコトニシマス. 先ヅソレデ今日ハドウイウ事ニツイテ申シマスト, 私ハ~~前回~~ノ前ノ生態学会デ發表シタ, 私ノ~~[illegible]~~別稿ニシタ考ヘノ保證 ~~[illegible]~~ ヲ得ンガタメニ, 一通リ文献ヲ調ベタツモリナノデアリマス. ソレデ諸大家ノ説ヲ借リ来ッテ, ソノ保證ノモトニモ一度自説ヲ述ベマス. ソレハ虎ノ威ヲ借ル狐デアルトノソシリヲ受ケルカモ知レマセンガ, 私ダケハ狐ドコロカ鬼ニモ及バヌ無名ノ一生態学者ナル故, 今回ノ生態学会~~[illegible]~~ノ論説ニreferスルコトナクシテ私自身ヲ主張スルハ, 少クトモacademicデナイコトヲ信ズルカラデアル. コノ点ニ於イテ, 私ハ文献ヲ尊重~~シ文献ニ~~シタイノデアリマス.

私ガ既ニ20年以上ニ亘ッテ自然ヲ友トシ来リ, 又卒業以来synecologyヲ専攻シテキタソノ總ベテノ經驗ノ結果ガ, 私ヲシテsynecologyノ理論ヲシテ私ニマデ要求シタノデアッタ. 私ハ決シテ理論ヲ弄ブ ~~[illegible]~~ ハシガタメノ理論家デハナイツモリデアル. ソシテ私ニコノ要求ヲ起サシメタ ~~[illegible]~~ モガ ~~[illegible]~~ 其ハ私ノ~~[illegible]~~ ~~[illegible] Synecologyノ理論ガ動揺シテキル. [illegible] 動揺シテキタ~~ノ研究ソノモノノ内容ニナッテハイルガ. 私ハ遅カレ早カレ, コレニ到達シナケレバナラナカッタデアロウト思ッテイル. コノ数年来Synecologyノ理論ガ動揺シテキル, 両陣営ガ加ッテキル. ソシテ私ニトッテ, 私ガ卒業以来金科玉条トシテ取リ入レテキタClements, Shelford一派ノアメリカ学派ノ学説ガ今ヤ諸ニ於ケル批判サレテキルノデアッテ, 彼等ハ ~~[illegible]~~. コノ危機ヲ如何ニ切リ抜ケルデアロウカハ, 吾等ガ見レバ極メテ興味深イモノデアロウガ, 而シfield ecologistトシテノ私ニトッテハ, 今マデ私ニシテ立ッテキタ地盤ガ~~[illegible]~~動揺ヲ初メタコトモ事実デアロウ. ダカラ私ハドウシテモ, 内外二ツノ立場カラ見テ, ドウシテモsynecologyヲ理論シテ, 私独リガ安心出来ナケレバナラナイノデアル.

デハ前ノ注ノconclusionヲモ一度ココニ述ベテ見マス.

1. community ハ society デナイ. i.e. 群聚ハ社会デナイ. 社会ハ種ヨリナル トイフコト、コレハ何トイフカ. 説明ヲ必要トスルコトデハナイ. シカシ私ガ素ニ私ノ synecology ノ対象ノ根底ヲナスモノナノデアリマス. ~~群聚ハ社会デ[illegible]~~ 私ノ 考ヘハコノウチカラ出発スルノデアリマス. シカシコレハ往々ニシテ申シマスガ説明ヲ除ク事実デハナイノデアル. ソウシテ群聚ヲ社会デアルトイフ見方ノ人モ, 特ニ plant synecologist 中ニハ多イノデアル. 独乙語デ community ニイフ言葉ニ当ルノハ Gesellschaft トイフ言葉デアル. 又 Biocenose トイフ言葉モ用ヒラレテキルガ コレハ更ニ一定ノ habitat トイフ概念ヲ含メタモノデ 従ッテ topographical ナ限定ガコノ言葉ノ中ニハ含ンデキルト思ハレル. ソレ故 community ニ厳密ニ同意義ノモノハ中ニ無イノデアル.

又 ~~Plants~~ 植物社会学者間デハ 今日 sociology. soziologie トイフ言葉ヲ用ヒル人ガ多イ. 例ヘバ Braun-Blanquet ノ 'Planzensoziologie' 1928ナラベ ノ如キデアル. シカシコレハ果シテ社会学ト訳シテヨイカドーカ疑問ガ存スルノデアッテ, 言ッテヰル Planzensoziologie ノ内容ハ英語デイフトコロノ plant synecology ト全ク synonymous ナモノナノデアル. 故ニ私ハ Planzensoziologie ト称シテ society デナイ, ~~community i.e.~~ Gesellschaft i.e. community ヲ対象トスルコトノ不当ヲ指摘シタノデアル. 群聚ハ社会デハナイノデアル. ~~人間~~ 我々ハ 犬ヤ鶏ヲ飼ヒ, 又我々ノ身体ノ中ニハ寄生虫ヤ, バクテリアモ少クハナイコトヲ知ッテヰル. シカシコレラノモノハ決シテ人間~~社会~~社会ノ構成メンバーデハナイノデアル. 又我々ハ米ヲ作リ馬鈴薯ヲ作ル. シカシ 米ヤ馬鈴薯モ決シテ人間社会ノ構成メンバートハイヘナイ. ソレラハ人間ニ必要欠クベカラザルモノデハアロウトモ, ソシテソレラハ人間トトモニ 一ツノ biotic community ヲ形成スルモノデハアッテモ, 馬鈴薯ヤ, 或ヒハ稲マデガ社会ノ構成メンバーデアルトイフコトハ許サレナイノデアル.

一方デ 動物学者, 特ニ ~~ant~~ 昆虫デ Hymenoptera ヲヤッテヰル人達ノ中ニハ, colony トカ family トカヲ以ッテ society 社会ト見ナス人ガ多イノデアルガ, biotic society トイフモノハ緊密ヲ作ラナクトモ, 少クトモ同種間ニハ 異種間ノ関係以上ノ繋リトイフ

Abstracts from Ecological Literature

flora
habitat
physiognomy → [illegible]

モノガ實質ヅケラレテヰル。コレヲ否定スルノハ Sippe ノ否定デアリ、ソレハ進ンデハ生物ノ進化ノ否定ニ一致スル
デアラウト私ハ信ジテヰルノデアル。ダカラ species 説トイフモノニ就イテ限定ヲスレバ、ソレガ race デアッテモ
或ヒハ genus デアッテモ、要スルニ一ツノ分類的集團トイフモノニ[illegible]研究ヲ[illegible]スルコト。
ソレデコソ生物學的意味ヲ見出スコト。コレガ ~~[illegible]~~ synecology ノ一ツノ方法ヲ示ヘルモノデアル「[illegible]」

2. ソコデ synecology ニ於イテハ研究者ノ見解ノ相違ガ示スヤウニ、ソノ發達史ニ於イテ、約100年前ヨリ[illegible]
ヲ ~~[illegible]~~ ノ中ニトリ入レルコトガ出来ナイノデアル。ソシテ synecological ナ單位トシテ association
ヲ define スルコトハ困難ニナッテヰルノデアル。然シニツノ association トイフモノハ[illegible]地域ニ於イテ[illegible]
モノデアル。例ヘバ Gleason (1926) ハコノ見方ヲ[illegible]否定シテヰルノデアル。ソシテ例ヘバ
[illegible] characteristic species トカ dominant species トカイフモノ
[illegible]、floristic ニ poor ナ中心、[illegible] ~~[illegible]~~ [illegible]
[illegible] tropic ニ於イテハ[illegible]デアル。[illegible]
要スルニ ~~plant community [illegible] clear ニ one unit area [illegible]~~ association ハ type デアリ
form デナイトイフコトニナル。∴ plant community 又ハ Vegetation トイフモノハ clear ニ one unit ニ[illegible]
モノデナイト ~~associat~~ [illegible]。~~Tansley [illegible]~~ [illegible] Clements ノ organism
theory ニ對スル一ツノ反対トナルノデアル。[illegible] Gleason [illegible] negative evidence ニ
[illegible]。然ラバ synecological unit トシテ何ヲ[illegible]ニ代ハルモノヲ示サナケレバナラナイカ。

3. association ノ否定ガ更ニ formation ノ否定ニマデ[illegible]問題ニ對シテ。ソレハ
life form トイフモノヲ以ッテ來テ。Raunkiear ノ theory ヲ[illegible] formation ハ physiognomy
ノ[illegible]モノデアリ。ソレハ community ノ dominants ノ life form ガ[illegible]
ナルモノデアルトイフ。ソシテ[illegible] life form ヲ示ス[illegible]研究ノ一團ガアリ。ソレハ[illegible]一ツノ
discontinuous ナ系列ヲ示スモノデアル[illegible]デアル。ソシテコノ discontinuity ハ[illegible]
spacial ニ definiteness ヲ示ヘルモノデアリ。自然ハ[illegible]
~~artificial~~ [illegible] association ノ[illegible] definiteness ニ就イテ。[illegible]

[illegible] Cajander [illegible] Waldtypen [illegible]

[illegible] ヨリ wissenschaftlich デアルト考ヘラレル. 私ハ formation ヨリモ association [illegible] ~~[illegible] synecological ト形容~~ [illegible] formation ガ topographical ト[illegible] dominant [illegible]. herb ハ shrub ハ [illegible] ecological ト [illegible] internal ~~struct~~ morphology [illegible] herb ト shrub [illegible]. 更ニ [illegible] interrelation ガ[illegible] ecological ト unit [illegible]. [illegible] interrelation ~~ハ organism~~ [illegible] ~~weak [illegible]~~. [illegible] organism theory ニ[illegible] ~~[illegible] theory [illegible] fantasy [illegible]~~ [illegible] interrelation ガ i.e. [illegible] layer ガ[illegible] layer ト[illegible] formation ハ [illegible] 一ツノ ecological unit [illegible] 森ノ下草[illegible] 森ノ下草[illegible] spring aspect [illegible] 一方[illegible] 下草[illegible] summer aspect [illegible] Höhle [illegible] undergrowth [illegible] Waldschicht [illegible] 一ツノ physical factor [illegible] Yapp (1925) ノ mutuality [illegible]. Waldschicht ガ Feldschicht ~~[illegible]~~ [illegible]. Feldschicht ノ方ガ Waldschicht ニ[illegible] topographical meaning [illegible] ecological ニ Waldschicht ノ dominancy [illegible] Waldschicht ト Feldschicht ノ internal relation [illegible] weak [illegible] Wald [illegible] dominant ノ life form [illegible] ~~shape~~ definite ナ physiognomy [illegible] topographical unit [illegible] ecological unit [illegible] topographical [illegible] unit [illegible] vegetation [illegible] physiognomy [illegible]

Yapp ノ Priority

[illegible]

association [illegible]
[illegible] gradation [illegible]

[illegible] fundamental unit [illegible] topographic [illegible] [illegible] [illegible] life-form [illegible] distinct [illegible] life-form group [illegible] unit community [illegible]

[illegible] adopted unit [illegible] synusia [illegible] Gams [illegible] Gams [illegible] Lorenz [illegible] Hult [illegible] Gams [illegible] Saxton (1924), Lippmaa (1931) Cain (1936) [illegible] topographical school [illegible] ~~ecological~~ school [illegible] Gams [illegible] Gams [illegible] Synusia [illegible] 1 grade Synusia [illegible] life form [illegible] 2 grade Synusia [illegible] life form [illegible] 3 grade Synusia [illegible] 2 grade [illegible] Synusia [illegible] association [illegible] association [illegible] topographical unit [illegible] Synusia [illegible] association [illegible] association ~~ecological unit~~ Synusia [illegible] Gams [illegible] 3 grade Synusia [illegible] 3 grade [illegible] Synusia [illegible]

[illegible] Gams [illegible] ecological unit [illegible] Waldschicht [illegible] dominant [illegible] dominant Synusia [illegible] life form [illegible] Waldschicht [illegible] Feldschicht [illegible]

Abstracts from Ecological Literature

サテ一面 Gams ノ指摘スルガ如ク [illegible] critique ナラザルベカラズ. 彼ノ主張ノ topographical ナ見方ニ対シ [illegible] 一方ニ [illegible] ~~[illegible]~~ テアルノデアル. ソレデ 彼ハ Synusia ナルモノヲ 定義シ floristic composition ニヨッテ分類スベキモノト考ヘテヰル. コレニ彼ノ分類ノ考ヘ方ノ 特徴 ヲ [illegible] ナノデアル. [illegible] ソノ結果ハ 大体 association ノ概念ノ 全ク 外ニ 立ツ life-form group ノミデ Synusia ヲ規定シテヰルノデアルカラ, 例ヘバ Synusia 2 ノ ~~[illegible]~~ 分類ナリ. 又ハ Synusia 1 ノ分類デアル. ソレハ総合 association ヲ指シテ microassociation ニ当ルノデアリ topographical school ノ主張スル所ノ [illegible] microsynusia ニ当ルノデハナイノデアル. ソシテ彼ハ floristic composition ハ異ナルモ life form ノ等シイ group ヲ全体トシテ一ツノ order ノ高イ単位ト認メ 之ヲ Isöcia ト命名シタ. i.e. Waldschicht ハ其ノ floristic composition ノ如何ニ関セズ 一ツノ Isöcia ヲナスト考ヘテヰル. Hult ヤ [illegible] 及ビ Gams ノ synusia ナリ又ハ Isöcia ヲ総合シタモノヲ考ヘテヰルノデアル. Warming ノ所謂 formation ノ考ヘ方ハ 大体ニ於テ Isöcia ニ当ルト考ヘテヰルノデアル. 即チ Gams ハ [illegible] 又 life form class ニ依ッテ ~~Hauptiso~~ main isöcia ナル分類単位 [illegible] デアルノデアル. 而シテ isöcia ヨリ上ハ次ノ step ノ [illegible] 可能トナリ ソレニヨリ synecology ノ本来ノ目的, formation ノ分類ハ [illegible] 完成スルノデアルト云フ.

ソコデ [illegible] 一方全体ヲ分類スルニ [illegible] 動物ノ [illegible] [illegible] 要旨デアルガ アルカ ソレデ 手段ノ [illegible] 研究デアル. 分類スルタメノ [illegible] ノ [illegible] デアル. ソレデ 之ヲ一ツノ system ニ分類スルタメニ Warming (1895) ハ Standort ノ Wassergehalt ニヨッテ, Schimper (1898) ハ temperature ニヨッテ Graebner (1910) ハ Nährstoffgehalt ニヨッテ Drude (1905, 1913), Diels (1908), Brockmann u. Rübel (1912) Rübel (1930) 等ハ physiognomy index ニヨッテ 分ケタ [illegible] 一ツノ Standortfactor ニ [illegible] process ヲ考ヘテヰナイノデアル. [illegible] life form class [illegible] i.e. life form ノ様ナ index [illegible] Raunkiaer ノ [illegible] デアル. ソレデ

Gams ハ Synusia 1° 2° 3° トシ、ソレニ Vegetation 単位ヲ加ヘルノデアルガ ソノ結局ハ夫々 society ト isöcia ト community トニ該当スルノデアル.

~~Rübel (1930)~~ ハ topographical ト云フ dominant Isöcia ニヨツテ決メラレ、ソレ~~ガ~~ヲ日本語 ~~ニ訳スルニハ~~ [illegible] culminating ~~point ヲ示スモノデアル~~. 故ニ [illegible] physiognomy ノミニヨリ決メテ居ル。ecological ナモノデハナイ. ~~life form [illegible]~~ ソレデ [illegible] ニハ方向性ガナケレバナラヌ. Life form ガ一ツノ [illegible] トイフコトガ [illegible] 方向性ヲ示シ、随ツテ之レヲ可能ナラシメル~~[illegible]~~モノデナケレバナラヌ. 之レハ life form ニヨル方向性ニ明カニ二ツノ方向性ガ認メラレル. 一ツハ stratum ニ応ジ方向性デアル [illegible] ~~[illegible]~~ [illegible] Isöcia デアル. [illegible] Isöcia ニヨル [illegible] 方向性デアル [illegible] デアルガ. [illegible] [illegible] ecological structure [illegible] ~~System~~ [illegible] topographical ト in biocoenologische System ト ecological ト synusiologische System トハ [illegible] 一ツノ [illegible] 中ニ [illegible] ガ出来ルノデアツテ. [illegible] 論デアツタ [illegible] 方向 [illegible] ~~[illegible]~~ [illegible] ~~[illegible]~~ [illegible] 意味深イデアツテ. ~~in society, isöcia, community [illegible]~~

[illegible] fundamental unit トシテ association [illegible] succession theory [illegible] [illegible] 結果 [illegible]. Gams [illegible] デアル. 一体 vegetational change [illegible] ~~Warming (1895) [illegible]~~ Hult (1885) [illegible] Cowles (1898) [illegible] climax [illegible] concept [illegible] Clements (1916) [illegible] vegetation [illegible] unit [illegible] climax formation [illegible] organic entity [illegible] organism [illegible] [illegible] idea [illegible]. [illegible] organismal theory [illegible] Cooper (1926) Gleason (1927) Tansley (1935) [illegible]. [illegible] association [illegible] Type [illegible] spatial [illegible] delimit [illegible] delimit [illegible]. succession [illegible] continuous [illegible] change [illegible]. individual [illegible] change [illegible] species [illegible] change [illegible] total [illegible] as a whole [illegible] as an organism [illegible] react [illegible].

∴ succession ノ phase トイフモノハ [illegible] 一ツノ type デアル。climax ハ一ツノ standard デアル
[illegible] theory ノ [illegible] ~~climax~~ climatic region ニ於ケル vegetation ハ [illegible]
climatic climax ニ [illegible] monoclimax theory ニ [illegible] ~~[illegible]~~
~~[illegible]~~ theory [illegible] idea [illegible]
[illegible] ~~climax [illegible]~~ [illegible]
[illegible]
[illegible] succession [illegible] Clements [illegible] climax-formation
= biotic community = biome [illegible]
[illegible] community [illegible]
[illegible] succession [illegible]
[illegible] '系列' [illegible] '遷移' [illegible]
[illegible]
~~[illegible]~~ [illegible]
[illegible] equilibrium or balance of nature [illegible]
[illegible] equilibrium [illegible] development [illegible]
[illegible] phase [illegible]
[illegible] isocia [illegible] isocia [illegible] ~~[illegible]~~ [illegible] climax
forest [illegible] economy [illegible]
climax [illegible]
[illegible] ~~[illegible]~~ [illegible]
[illegible]
[illegible] peneplain [illegible]
[illegible] equilibrium [illegible] ~~[illegible]~~ Davis ノ physiographical
Cowles ト Clements ノ succession theory [illegible] Davis ノ physiographical cycle [illegible]
vegetation

[illegible] 内容 [illegible] equilibrium [illegible]
[illegible] climax [illegible] Tansley [illegible]
[illegible] ~~[illegible]~~ [illegible] climax [illegible] climax [illegible]
[illegible] phase [illegible] standard [illegible]
[illegible] climax [illegible] ~~geog~~ geographical regions
[illegible] monoclimax [illegible]

Cain 1936

Synusiae as a basis for plant sociological field work. The American Midland Naturalist. vol. 17, pp. 665-672

Lippmaa's ganzes [illegible] synusial system [illegible]
ie synusiae (= [illegible] life-form community) =
full rank of association [illegible].

~~Lippmaa, T. 1933.~~

Conard (1935) - Central Long Island, plant communities [illegible] single synusia [illegible] community
= association [illegible].

Lippmaa - life-form groups = formation [illegible]

p. 666 There are, of course, examples of a close interdependence of species constituting the associated synusiae, but they seem to be less frequent than examples of a ~~[illegible]~~ looser interdependence.

p. 67 Cain (1934) - [illegible] community [illegible]
[illegible]

Lippmaa's Hepatica triloba - [illegible] association [illegible]
herbs, shade-dependent [illegible] arborescent stratum [illegible] floristic
nature [illegible] largely independent [illegible]

Cain 1936

p.667 One has only to study "Die Buchenwälder Europas" (Rübel, 1932) to realize in how many combinations (with various synusias) the respective Fagus-Pulmonaria-association may occur, and how various, with respect to minor synusias, an association can be when the [illegible] as a whole is considered to be the association.

Second, many synusias which occur as inferior layers in one vegetational complex occur elsewhere as the superior layer of a different complex, or occur alone. When such synusias occur alone no sociologist hesitates to consider the community as an association (or associes), but when the same community occurs as an inferior layer in a phytocoenosis it is supposed to lose its identity, even though keeping its characteristic floristic assemblage and becomes merely a part of an association. For example, the seral stages in a Sphagnum bog complex (Sphagnum-Oxycoccus; Chamaedaphne-Kalmia; Vaccinium corymbosum-Nemopanthus; Larix) are readily recognized as associes, i.e. as distinct communities. However in progressively older communities toward the periphery of these concentric zones, the communities at first separated consequently become telescoped by the inward migration of the progressively higher synusiae and here what was once an independent community becomes a layer society. 319

p.113 These lower societies frequently maintain their essential floristic identity. To isolate the situation, ~~[illegible]~~ Sphagnum-Oxycoccus as a lower society under Chamaedaphne, Vaccinium, and also under Larix laricina, in the youngest part of the bog, is a distinct community above or a dominant.

Gleason, [illegible] Cain [illegible]

[illegible] In view of the fact that the several synusiae of a phytocoenosis have strong inter-relationships vertically and that within a synusia the horizontal relationships are relatively weak, it seems logical to reject Lippmaa's concept and not to elevate the synusia to the rank of association. ~~[illegible]~~ [illegible]

Any adequate picture of the complex stand (phytocoenosis) must be synthesized from knowledge of the individual synusiae composing the stand. They are the logical and practical units for field analysis and for ecological interpretation. By this method, as already pointed out, no existing units are denied. One can still ~~[illegible]~~ divide the vegetation of a region into associations, ~~[illegible]~~ consociations, sociations, even formations, etc., most of them being composed of two or more synusiae. [illegible]

[illegible] 1935], Amsterdam, Sixth Botanical Congress, Geobotanical Section [illegible] recommendation of Lippmaa [illegible]

Cain 1936

r Pavillard, [illegible]

Recommended: 1. 'To use the term 'sociation' for vegetation-units characterized mainly by dominance in the different layers, in the sense of Scandinavian plant sociologists.

2. To use the term 'association' for vegetation-units characterized mainly in the sense of Zürich-Montpellier plant sociologists, or at least for units of the same order of sociological value, 'subassociation' and 'facies' can, where necessary, be used for their subordinate units.

3. To unite sociations and associations into 'alliances' in the sense of Zürich-Montpellier plant sociologists, and the alliances into higher ~~[illegible]~~ units.

Cain: University of Tennessee, Knoxville,
Tennessee and the Biological Laboratory,
Cold Spring Harbor.
Long Island, N. Y.

Du Rietz 1936

p. 580 One of the most striking features of the nineteenth [illegible] phytosociological discussion of the last decade is the steadily increasing recognition of the theoretical and practical importance of one-layer communities as the basis for ecological research.

p. 581 None of these one-layer communities is entirely confined to this biocoenose but is found also in several or even many other biocoenoses, combined with other one-layer communities in various ways.

~~Earliest~~ One-layer communities as elementary phytosociological units [illegible] recognized by Lorenz (1858), Kerner (1863), Hult (1881), Warming (1895, 1909 etc), Schröter (1902), Brockmann-Jerosch and Rübel (1912), Clements (1916) etc.

p. But the honour of having first realised their full importance for the theory and practice of plant sociology is undoubtedly due to Helmut Gams, who in his classical dissertation of 1918 not only introduced the term 'Synusia', first proposed by Rübel in a lecture, but .....

p. 583 The elementary one-layer communities, or consocions (-societies), are not recognized in Lippmaa, or only casually mentioned as 'facies'.

p. 583. This seems to be due to the widespread belief that there is only one fundamental unit of phytosociology, and that the term 'association' must be reserved for this unit. Since there are obviously many fundamental units in phytosociology, and very different opinions as to which of them should be regarded as the fundamental unit, this belief seems to be one of the main obstacles preventing a general agreement as to the use of the term 'association'. - - - - - - - - - - - - - -

p. 584 I cannot see that there is any more magical power in the word 'association' than in any other term, and it seems to me a purely practical problem to decide for which of many fundamental units of modern plant sociology we want to reserve the term 'association'.

Du Rietz' proposals in the terminology:

Synusiae 1930		biocoenoses 1935	
Du Rietz 1930	Du Rietz Gams * 1935	Du Rietz 1930	Braun-Blanquet Du Rietz [illegible] 1935 (= Amsterdam Congress)
consociation	society (Verein)	sociation	sociation
		consociation	(consociation)
association	union	association	association
federation	federation	federation	alliance (Verband)

* Lippmaa's [illegible] accepts [illegible]

1. [illegible] field [illegible] may have escaped,

2. [illegible]

3. [illegible]

([illegible])

Wheeler, W. M. - Emergent evolution and the development of societies. 1928.

Social aggregates — if we employ the term "social" in the broadest sense — may be divided into two great groups, the heterogeneous and the homogeneous, the former comprising the associations of organisms belonging to different species, the latter of individuals of the same species and therefore of common genetic origin. In either group *the simplest association obviously obtains between two interacting individuals, the combined behavior of which may be said to form an emergent pattern different from, though depending on, the functional peculiarities of the component organisms.*

True societies are possible only when the components belong to the same species, but the nature of their association may be very diverse. They may be said to belong to three main types according as nutritive, reproductive or defensive functions predominate in the emergent social behavior.

Now the various examples which I have very briefly discussed indicate that *there is something fundamentally* social in living things, and closer *scrutiny shows that this must be a characteristic* of of all life, since every organism is, at least temporarily associated with other organisms since it only with members of the opposite sex and with its parents, and every organism is at least implicated in some biocoenosis. This statement holds good even of such supposedly unsocial creatures as bears, tigers, sharks, tiger-beetles and spiders. There are, in fact, no truly solitary organisms. We may say, therefore, that the social is a constituent as well as an emergent of all life in the sense in which Morgan speaks of mind as being both a constituent and an emergent of life. And like the more complicated mental emergents, such as the instincts and [illegible] [illegible], the social emergents make their appearance sporadically and often in unrelated groups of organisms, as I have shown among the insects. Indeed, the [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] in the most general sense—a continued [illegible] through the [illegible] [illegible] to the association with the organization of [illegible] [illegible], that [illegible] results in groups or classes [illegible] [illegible], [illegible] characterized by [illegible] [illegible] [illegible] [illegible], [illegible] with an irresistible tendency to [illegible] ever organize themselves into more and more complex emerging wholes, association may be regarded as the fundamental condition of emergence. We are, I believe, bound to assume that the organization is entirely the work of the components themselves and that it is not initiated and directed by extra-social and extra (27 p.) temporal "entelechies" (Driesch), "organizatory factors" (Eldridge), "deity" or "élan vital" (Bergson). Such agencies are conceived as possessing marvellous foresight, although the slow multimillennial imperfect and blundering, 8. the abject and tragic failures, would seem rather to be a vast monument to their colossal and hesitating inadequacy, blindness and stupidity. The resort to such metaphysical agencies has been shown to be worse than useless in our dealings with the inorganic world and it is difficult to see how they can be of any greater service in understanding the organic. (27 p.) 11

Clearly, as against these, realism is a new interpretation of the commonly accepted facts, a new reading of the character of cosmic evolution. 2.

1938

Elton 1935

Woodland Bird Communities in England

/ Summary.

1. A National Broadcast enquiry into woodland bird-life was made in 1933. The results of censuses in 23 woods are recorded. These are compared with available figures for the Oxford Bird Census and for Finland.

2. Woodland birds in Britain form a coherent and ancient community that is much the same in different woodland types (taking dominant trees as the criterion). It forms part of a life-zone widely spread over Europe.

3. The number of species of regular woodland birds in this country is in the neighbourhood of 30. There is a definite series of ecological niches that is the same in widely separated countries.

4. Present afforestation changes (increase of planted conifers) will not much affect the species found, but may cause lower densities and a redistribution of species in different succession stages of vegetation.

Scharff: European Animals

Scharff [illegible]

p 37

The author, like many other writers on kindred subjects, has felt the need of a comprehensive term to include both fauna and flora which [illegible] designate the total of animal and plant life of a given region or period, but there are [illegible] the animal and plants of any geographical area or geological period. As such a term I would suggest 'Biota', not only because [illegible] but also because of its beauty and obvious relationship to the term 'Biology' as embracing Zoology and Botany. Biota [illegible] 2.

[illegible]

p 5

Forbes's theory, once quite generally accepted, that the similarity between the [illegible] [illegible] 11

[illegible] 6.

[illegible]

p. 173. the animals and plants which we now find there [illegible] in the Arctic regions originated during the glacial period during the cold climatic conditions and afterwards were driven to the [illegible] on the tops [illegible] mountain accommodating themselves to the more severe climate.

2[illegible] 18[illegible]

p. 312. This [illegible], which Dr. [illegible] has so remarkably [illegible] and elaborated, renders it certain beyond a doubt that the presence in central Europe of a [illegible] and [illegible] assemblage of animals and plants characteristic [illegible] of the Arctic and [illegible] regions is due to the [illegible] climate during the [illegible] [illegible] during the glacial period [illegible] central Europe plants animals [illegible]

Bodenheimer '38.

p.152 Synusia includes all subdominant life form groups, whether in horizontal layers or not. The term union is now proposed for these 'einschichtige Pflanzenvereine' (Du Rietz).

p.154 A system of organization of plant and animal life on a basis of life-form group (synusiae) was proposed by Gams (1918). Obviously much of the complexity of communities is due to the fact that each biocoenosis usually is composed of many synusiae.

p.155 Mats of algae, moss, and lichens on soil, rock, and bark usually are considered one-layered (without rooting), but even these communities are likely biocoenoses of two or more synusiae.

p.157 Stands smaller than the minimal area are likely to be fragments of the association, without the characteristic combination of species

... the species-area curve used to indicate minimal area will not flatten out on account of the lack of species dominance. In these communities there is usually physiognomic dominance and sometimes generic or family dominance.

Bodenheimer '38

p.158 No association. ... has the same constant species throughout its entire range. Likewise, fidelity of a species to a community must be a rather local phenomenon since the same species will live under different conditions in different parts of its range and hence be associated with different communities.

B. P. UVAROV

Locusts and grasshoppers

1928

London

Elton 1933

Cameron

1913 J. Econ. Biol. 8, 159

1917 Trans Royal Soc, Edinburgh 52, 37.

Morris 1920

Ann. Applied Biol. 7, 144

1922 " 9 253

1927 " 14 442

Kashkarov u. Kurbatov. 1930 Ecology 11, 35

Longstaff 1932, J. Animal Ecology.

○ indicator ノ 意義

○ species number ノ [illegible]

Elton ノ [illegible]

○ characteristics [illegible] community / structure [illegible]

Uvarov: Locusts and grasshoppers.

The behaviour of gregarious locusts

p.77 band ハドーイフ理由デ出来ルカ

a) 個体ヲ互ヒニ接近サセルハタラキ (to keep close to each other

b) 個体ノ互ヒノ動作ヲクリカヘサセルハタラキ (to repeat each other's movement

コノ二ツガ gregarious instinct ヲ形成スル要素トスル.

band ノ形成

p.78. a). コノハタラキガ何ニヨルモノカハ例ヘバ visual ト olfactory ノ other sense ニヨルカハマダワカッテヰナイ. 此シ moult ノ時ニハ個体ハ less gregarious ニナルトイフコトガアル. 太陽ニヨッテ暖メラレル石ノ上ナドニ hatch シテ間モナイ幼虫ガ band ヲ形成シテヰルノハ thermotropism ト phototropism ト関係ガアルラシイ. La Baume (1918) ニヨレバ a crawling hopper stops where it finds the optimum temperature of the surface; other hoppers stop at the same places, partl. for the same reason, partly owing to gregarious habit, and a band results.

p.79 Nikolsky (1925) ハ animal heat ノ利用ハ whole band ノ temperature ヲ optimum ニ高メ保ツトイフ解釈ヲ下シタ. コウナルトコレハ physical デナク biological トナルガ実験的説明ハナイ.

此シコレデハマダ集リニ導ク原因ガ明カデナイ. 眼ヲフサイデシタ実験[illegible]モナイ

ソレ故コノ説明ガ, 既ニ hatch シタトキ, 卵ガ more or less dense groups ニ~~生~~産カレテヰタトイフ事実ニ帰着セシメラレルナラバ, 一種ノ生存論トシテ一応説明ノ困難ヲサケ得ルノデアル.

ヨリ先キハ Nikolsky ハ thermotropism ヲ以テ説明シタガ Kiritschenko ハ地上ト
→ 空気ト同温又ハ高温ナルトキニモ 植物ニ上ルコトガ見ラレ，又植物ノ先ッポ
last ray ヲ捕ヘヨウトスルコトヨリ之ヲ以テ phototropism — heliotropism ト
シテヰル (p. 83 参照)

movement of band

p.79 first stage ノ終リカラ next stage ニウツリ, band ノ daily regime ハ夜ニナルト植物ノ上ニ登リ, 朝ニナルト地上ニ下リテクル.
コレハ地上ノ方ガ夕方早ク冷エ, 朝ハ早ク暖カクナルカラ, thermotropism トシテ説明シ得ル … Nikolsky ('25), Kiritschenko ('26).

p. 80 コノ活動開始時間(朝)ハ hopper ガ大キクナル程 高温度ヲ要スル
温度上ル程 活動性大トナリ, ソノ結果 less dense トナル代リニ band ノ占メル area ガ夜ノ三倍トナル … Moritz-Ramanova ('25).

N.B.
コノ様ニ活動性大ナラザル故ニ作ラレテヰル band ハ 活動性大ナルニモ拘ラズ作ラレテヰル 蟻ヤ蜜蜂ノ colony ト社会学的ニハ非[illegible]ナモノデアル.

活動性 小	→	大
I	II	III
Orthoptera, Aptera, Rhynchota etc ノ band	一般ノ孤立シタ昆虫生活	family ガ nest ヲ center トシテ 社会的活動ヲ積極的ニシテヰル.

食物豊富 → 一般ニソウ豊富デナイ 活動性大トナル所以 → 社会生活ニヨリ再ビ豊富トナル.

食物獲得方法
grazing type → hunting type (parasitic ヲ含ム) → storage 又ハ agriculture ヲ認メ得.

コノ段階間 アリ …{ 産卵数大 → 小 → 大]

幼虫ト成虫トノ分化
小 → 大 → 幼虫ハ成虫ノ保育ニヨツテノミ成長シ得ル

知能ノ進化 小 ——→ 大

外界カラノ独立性 小 ——→ 大

b) 隣接者ノ動作ニヨリウゴクカ—imitateスルカ

p.78 コノ reflex ハ visual ナリヤ或ハ vibration of air ナドニヨルノカハ一応考究スル必要アル. 前者トスレバ Loeb (Forced Movement, Tropisms and Animal Conduct; 1918; p. 131 ノ theoretical explanation ~~[illegible]~~ ガアル. i.e. This author believes that the movement of the images of surrounding objects on the retina causes reflex movements that aim at stopping this movement by moving the eye (i.e. the whole animal) in the same direction as the objects move.

p.81 A band once started on its march positively cannot stop, since the hoppers, owing to their gregariousness, strive to keep as close as possible to each other and produce continuous mutual stimuli resulting in jumps and crawling. The band therefore must move, regardless of where the movement may lead it, and the result is the blind march of masses of hoppers.

p.82 二ツノ band ガ出会ッタ時ニハ一ツトナッテ普通大キナ band ノ向フ direction ニ進ム.

N.B. コレハ力ガ考ヘラレル 二ツノ力ガブツカッタ時ニハ必ズカヽル作用ガ行ハレルコトヲ社会学的ニ考ヘテヨイノデナイカ.

causes of movement

p.83 1. 食物説

Nikolsky ノ反対.

植物ノ繁茂シタ土地ニ止マラナイデ desert ニ入ル. 前者ニ食ヒ足リナカッタモノガ時ニトマッテ食ッテ居ルコトモアルガ. ソレニ行動開始モ行動ヲ停ルトキモトモニ食物ト関係ナイ

p.87 コレハ flying swarm ニ対シテモイヒ得ル

コレニ対スル Uvarov ノ conclusion ハ次ノ如シ

This observation disposes of the assumption that migration has the object of finding food supplies. At the same time, it shows equally clearly that the emigration has nothing to do with the "quest for new breeding-places," as is very often suggested. Analogous cases of the stoppage of swarms in places wholly unsuitable either for feeding or for oviposition are often recorded in the literature, and there can be only one conclusion based on them, viz. that it is absolutely impossible to talk of emigration having an objective; only its causes can be considered, and these in my view lie in the physiology of the insects.

2. parasite 説 (Rossikov, '99)

コレニ対シテモ Uvarov ハ反対.

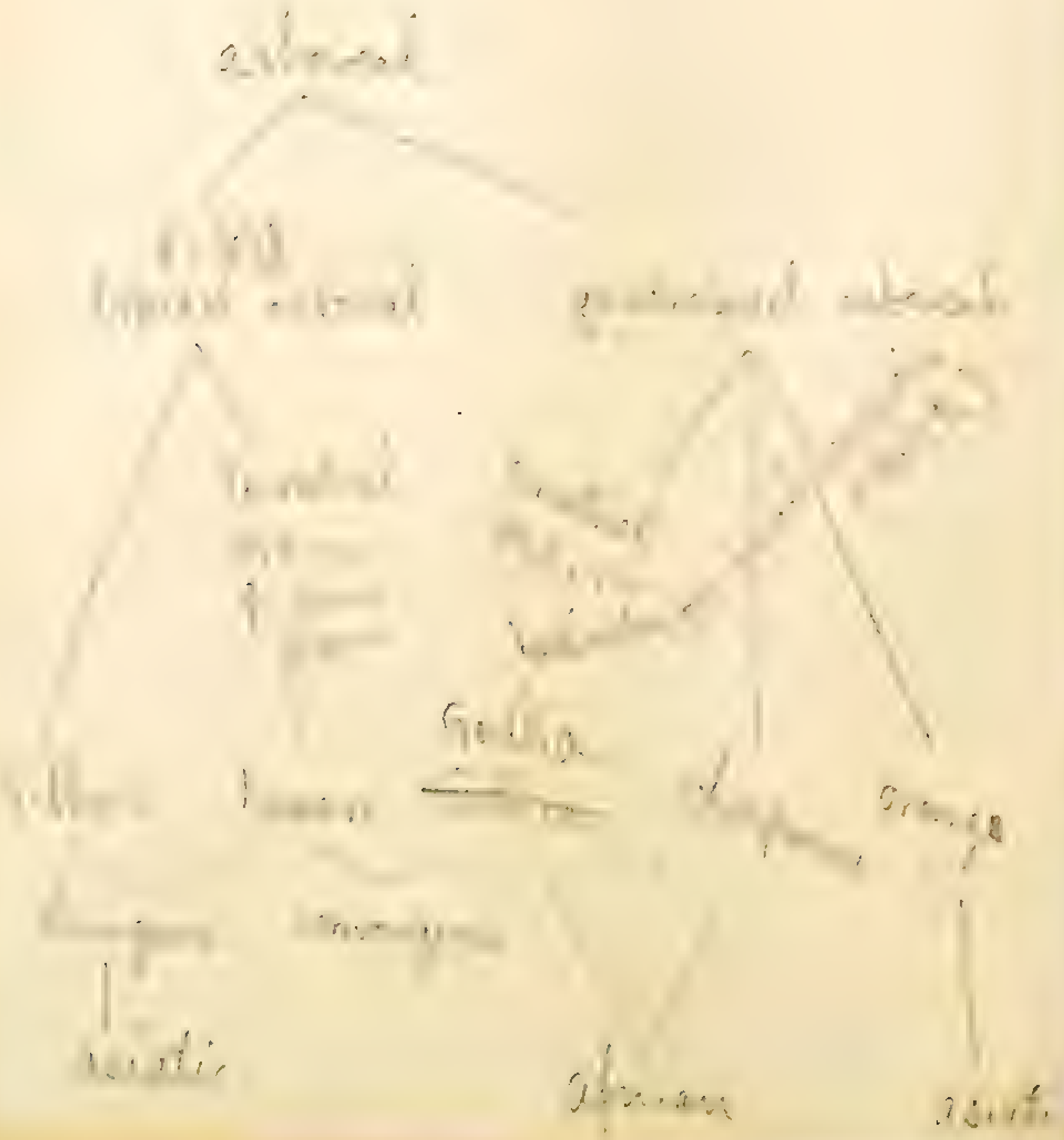
結局 emigration from their breeding-ground ハ目的ナキ 種族保存ニ関シテ説明サルベキヨウナモノデハナイ.

(12= 1940. Feb. 28)

Yerkes & Yerkes
The great apes

1929

Gibbon [illegible] opposite origin
(Pocock)



Gibbon

Gibbon — [illegible] sex life [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

child, [illegible] whole [illegible]

[illegible]

large [illegible]

[illegible]

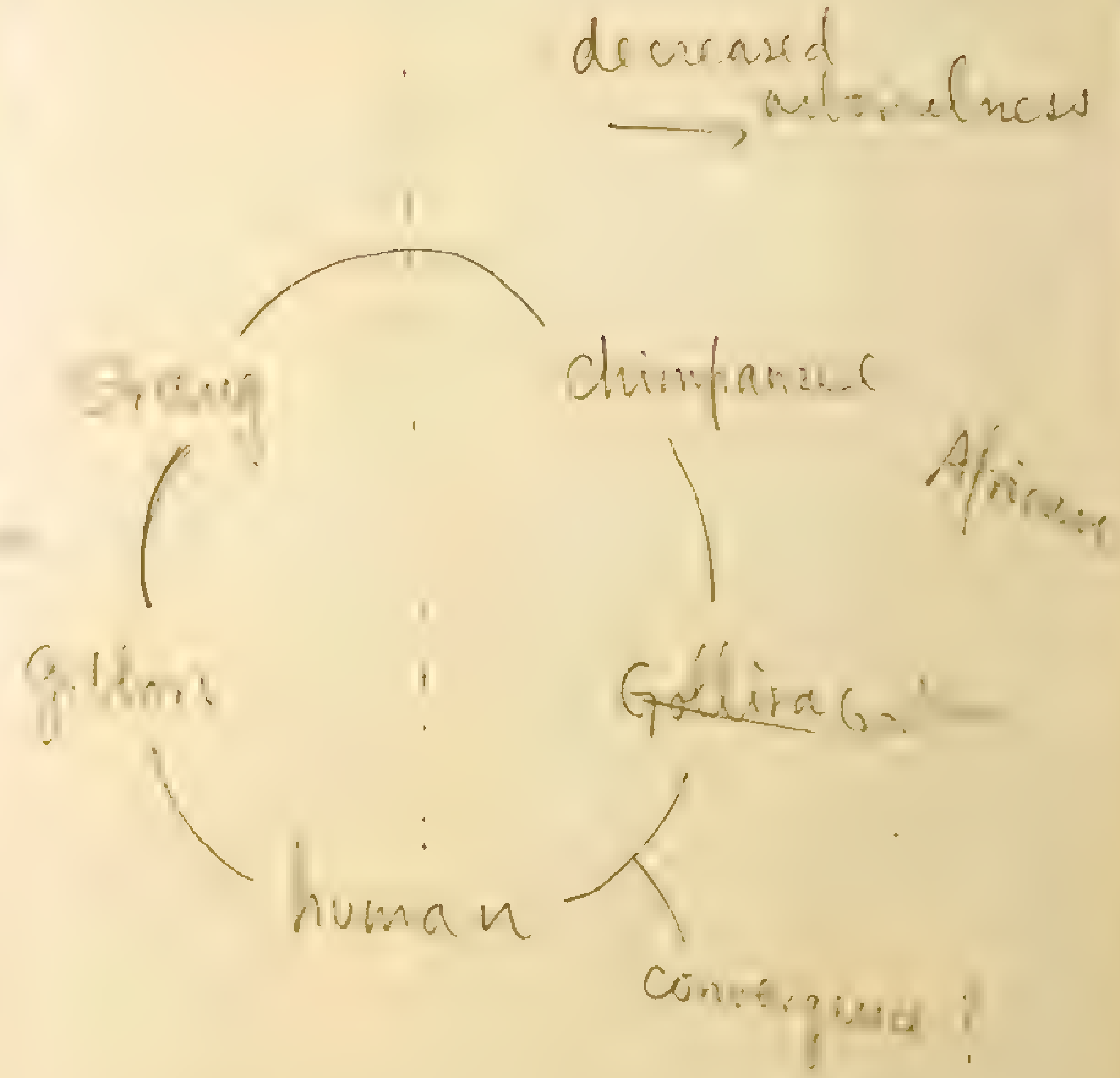
[illegible]

[illegible]

[illegible]

[illegible] (p.71)

[illegible] gibbon [illegible]
[illegible]


decreased
arborealness
orang
chimpanzee
Africans
gibbon
Gorilla
human
convergence!

[illegible]
[illegible]

mating season [illegible] 1797?
Orang [illegible] (p.141),
Gibbons [illegible]

length of [illegible] (p.141)

[illegible] (p.142)

Gorilla (social unit).

Garner 1896 young male, solitary [illegible] family group, one male (polygamous)

family 2–15, two or three males, [illegible]

Jenks 1911.

single family [illegible]

Oertzen 1913.

Reichenow 1920, social unit a ~~[illegible]~~ [illegible] 10–20 (West Africa) 20 30 (E. Africa),

[illegible] family [illegible] (5 [illegible])

[illegible] polygamous [illegible] 4 [illegible] group [illegible]

polygamy

Bradley 1922. mountain gorilla [illegible] 1♂ 2♀♀ 1 group [illegible] = Barns 1922

Akeley 1923 lowland g. [illegible] more than 1♂ one instance [illegible] old ♂♂

~~[illegible]~~ 1♂ several ♀♀ [illegible] polygamy

Reichenow = [illegible]

Yerkes 1929 p.434 conclusion lowland [illegible] monogamy, highland polygamy

[illegible] 1923 m.g. 30 [illegible]

Burbridge 1925 m.g. 1♂ ♀♀ [illegible] ♀ with young

p.435 conclusion Ordinary the social unit is the band or herd, which may consist of several families.

	ht	wt	arboreal	[illegible]		
gibbon	32 inch	10 pound		[illegible]	1	1
siamang	34	20		"	1½	4
orang utan	48	160		"	[illegible]	3
chimpanzee	50	150		"	1½	2
gorilla	5 feet	500		"	[illegible]	5

— [illegible]

largest gorilla 5ft 7 inch 360 lbs
" [illegible] 6ft 1 inch 183 "

	habitat	[illegible] life	[illegible]	[illegible]	[illegible] locomotion	terrestrial locomotion	handedness	[illegible]
gibbon	S. Asia	2	5	1	1	5	4	✓
siamang	Sumatra, Malay	4	4	2	2	4	5	/
orang	Sumatra, Borneo	3	3	4	4	3	2	0
chimpanzee	Africa	1	2	3	3	1	1	0
gorilla	"	5	1	5	5	2	3	0

dominance (p.511)

Siamang & gibbon = dominancy i.
leadership

chim. monogamy
gorilla polygamy (p.592.)

Ecological Literatu

Gorilla 第2頁 1977年

Savage and Wyman	1847.	bands
Du Chaillu	1861	not gregarious
"	1867	band
von Koppenfels	1877	family
[illegible]	188[illegible]	family
Garner ([illegible])		10~[illegible]

[illegible]

[illegible] solitary male / [illegible]

[illegible]

p.432.

Chimpanzee ハ Gorilla ヲ [illegible] [illegible] 2～3 ♂ ヲ [illegible] (Garner ニヨル,

Gorilla Solitary male ハ 若イ (〃)

〃 [illegible] solitary female ハ [illegible] (〃)

p.49
Gibbon ハ [illegible] [illegible]ノ群ニ[illegible]
[illegible]

Orang utan

p.135
in isolation or in very small group.

mating season ニハ male ハ alone [illegible]

Chimpanzee

p.249
~~[illegible]~~
Except for isolated old males and the temporary isolation or segregation of other individuals, the chimpanzee is highly social and always lives in bands which are constituted either by a single family or a number of families;

---

p. 247
1 old male 2♀♀ (with infants) + several immature individuals.

p.250
polyg~~amy~~yny カ monogamy カハワカラヌ

Livingstone
Forbes
Reichenow

several author
more than one apparently mature female with a matured male

Sexual intercourse may occur throughout the year, and births are not strictly limited to any one season..

Arverdes, Fr., 1927, Social Life in the Animal World, p.43.

According to Volz*, the orang-utan lives in solitary permanent mateship.

*コノVolzトイフノハ巻末ノbibliographyニナイガ 恐ラク次ノモノナルベシ

Volz, W., 1921, Im Dämmer des Rimba, Breslau.

Yerkes p.566 ニ.

The transition from pronounced gregariousness to family life seems to occur between gibbon and chimpanzee.

sociability ト social dependance ガ lemur カラ ape ヘト 増ストトモ individualism モマタマス

expression of sympathetic interest and altruism モ lemur → monkey → ape → man ノ経序ナリ.. 経ナシ.

P.567 The same may be said of monogamy, for although it may exist in any of the four groups which we are comparing, so also, according to pertinent observations, may polygamy. Whether there is definite phylogenetic tendency toward the one or the other type of family it is impossible to say. But in any event the family as social unit seems to become more prevalent and also more stable as we progress from lemur to man.

	period of gestation	Status at birth	period of complete dependency on mother	suckled for	sexual maturity
Lemur	4 – 5 ヶ月	relatively very large, mature, with senses functional	A few hours or days	several days or a few weeks	within a year
monkey	6 – 8 "	relatively large, mature, with senses well developed	A few days or weeks	several weeks	within 2 – 3 years
ape	7 – 9 "	relatively very small and helpless, with senses partially functional	3 – 6 ヶ月	several months	5 – 8 ヶ年 (gibbon 及 Siamang) 8 – 12 " (orang-outan, chimpanzee) ~~gor~~ 10 – 14 (~~gollira~~ gorilla)
man	9 "	relatively small and helpless, with senses partially functional	almost a year	1 to 2 years	10 – 14 (man)

p. 542.

There are definite indications of monogamy in the chimpanzee, ~~wheares~~ whereas in the gorilla polygamy almost certainly occurs. Concerning gibbon and siamang there is no basis whatever for statement.

Our tentative inference is that both monogamy and polygamy exist in one or another or all of the anthropoid types and that in all probability both relationships are discoverable in each of the manlike apes.

ト注ニテ

orangoutan ニハ temporary monogamous or polygamous
chimpazee ニハ relatively permanent monogamous and possibly also polygamous
gorilla ニハ polygany presumably in the mountain species and monogamy, possibly. in the lowland species

終結了,

duration of pregnancy

Zuckerman (1932) p. 28

lemurs.	145 days
Tarsius	unknown
Platyrrhini	
Hapalidae	
marmosets	150
Catarrhini monkey	150–180
chimpanzee	9ヶ月 (lunar month)
orang utan	約10ヶ月 (275)
human	280

Yerkes (1935年) p. 1029 =

	gestation	move about freely within	self-dependence ごろ	sexual maturity
lemur	4–5 (lunar month)			1年以内
monkey	5〜6 (lunar month)	4 weeks	6ヶ月	2–3年
ape	7–9	3〜4ヶ月	1〜2年	8–10年
man	10	12〜16ヶ月	4–6年	10–15年